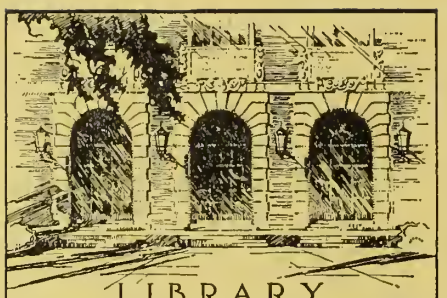

The Flora of the Prairies

. . . BY . . .

HENRY ALLAN GLEASON

THESIS

FOR THE

Degree of Bachelor of Science

IN THE

COLLEGE OF SCIENCE

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UNIVERSITY OF ILLINOIS

May 30, 1901

THIS IS TO CERTIFY THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

Henry Allan Gleason

ENTITLED The Flora of the Prairies

IS APPROVED BY ME AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE DEGREE

OF Bachelor of Science

T. J. Burrill

HEAD OF DEPARTMENT OF Botany

THE FLORA OF THE PRAIRIES.

Undoubtedly the most remarkable natural feature of the original territory now forming the state of Illinois was its extensive prairies, accepting the term prairie in its widest sense. Beginning with a few small and scattered representatives in Jackson county, they extend northward through the states, and constituted about two-thirds of the entire area. In the central portion they occupied perhaps nine-tenths of the area.

The origin of the prairie has been a matter of much discussion for years, culminating in the period from 1850 to 1860, when the prairie states were being settled the most rapidly. Numerous theories, some of them absurd in the extreme, were advanced, the American Journal of Science being a favorite medium of publication. Without stopping to discuss their relative merits, a series of extracts from various authors bearing on the origin of the prairie will be given, together with a resume of the subject from Professor Rolfe of the University of Illinois. The theory now generally accepted is practically the same as that of Lesquereux, published over thirty years ago in the Report of the Illinois Geological Survey.

From Dr. J. S. Newberry, in "A Report on the Flowering Plants and Ferns of Ohio." (1860.)

"The great controlling influence which has operated to exclude trees from so large a portion of our territory west of the Mississippi, is unquestionably a deficiency of precipitated moisture To this cause are due the prairies of Oregon, California, New Mexico, Utah, Nebraska, Kansas, Arkansas, and Texas. Throughout this great area we find every variety of surface, and soil of every physical structure, or chemical composition, ---unless in exceptional.

circumstances, where it receives an unusual supply of moisture, --- if not utterly sterile, covered with a coating of grass."

"To the great plains, the typical prairies of the far west, the theories proposed for the origin of prairies, viz: that of Prof. Whitney, that they are due to the fireness of soil; or that of Mr. Lesquereux, that thay are beds of ancient lakes; that of Mr. Desor, that they are the lower and level reaches of sea-bottom, or, finally, that which attributes them to annual fires; are alike wholly inapplicable."

"The prairies bordering on, or east of the Mississippi, may be, and doubtless are partly or locally due to one or more of the conditions suggested in the above theories; but even here, the great controlling influence has been the supply of water. The structure of the soil of the prairies, coinciding with the extremes of want and supply of rain characteristic of the climate, have made them now too dry and too wet for the healthy growth of trees. A sandy, gravelly or rocky soil or subsoil, more thoroughly saturated with moisture and more deeply penetrated with the roots of the forest trees affords them constant supply of the fluid, which to them is vital. This, as it seems to the writer, is the reason why the knolls and ridges, composed of coarser materials, are covered with trees; while the lower levels with firmer soil are prairies. Where great variation of level exists, the highlands are frequently covered with trees in virtue of the greater precipitation of moisture which they enjoy."

Prof. Dana in the "Manual of Geology" (1863) without going into details, announces the general result, thus: "That prairies, forest regions, and deserts, are located by the winds and

temperature, in connection with the general configuration of the land."

From "Outlines of the Earth's History" by N. S. Shaler. (1898.)

"In the opinion of the writer the treeless character of the prairies is accounted for by the habit which our Indians had of burning the herbage of a lowly sort each year, so that the larger game might obtain better pasturage. * * * Beginning this method of burning in the arid regions to the west of the original forests, the natural action of the fire has been gradually to destroy these woods. Although the older and larger trees, on account of their thick bark and the height of their foliage above the ground, escaped distruction, all the smaller and younger members of the species were constantly swept away. Thus, when the old trees died, they left no succession, and the country assumed its prairie character."

Hall's theory of the formation of the prairies. From "Notes on the Western States."

Annual plants first occupy the soil because they arrive at maturity in the shortest time. During the dry, late summers and autumns, the herbs of the uplands would wither and dry, while in the bottom lands, and along the streams the plants would remain green until late in the autumn, in consequence of the greater moisture. These plants of the lowlands would be protected from fire, and in them the shrubs and trees could come to maturity, and gradually occupying all the lowlands, would spread up the hillsides as far as the high table lands, where there was henceforth an annual struggle with the prairie fires which effectually prevented their farther spreading.

From "Illinois in 1837" by S. Augustus Mitchell.

"On the origin of the prairies it is difficult to decide; various speculations have arisen from this subject, giving rise to a diversity of opinions. The level surface of the state of Illinois, (according to the ideas of many) was formed by inundations. The whole of the state, from a few miles north of the Ohio river, where the prairies commence, affords tolerably conclusive evidence of having been once covered with water, forming probably a large lake similar to lake Michigan, Erie, etc. When the lowest point near the Grand Tower was worn away, so as to drain the water off, it was left with a rich, soft, muddy surface, nearly level, as we may suppose is the case in the present lakes. When this soil was drenched with rains, the water gathered into little rills as they descended to the lowest parts, would intersect the soft soil, and finally wear away much of the rich surface: hence we see the elevated parts the most fertile, while the lower and more broken and timbered land is the poorest soil.

"From whatever cause the prairies at first originated, they are undoubtedly perpetuated by the autumnal fires that have annually swept over them from an era probably long anterior to the earliest records of history. Along the streams, and in other places where vegetation does not suffer from the drought of the latter part of summer and early autumn, and of course becomes sere andcombustible less soon than it does in the plains which are drier, the fire does not encroach much; consequently the forests prevail there, and probably gradually increase in some places upon the prairies. As soon as these are ploughed, and the heavy grass kept under, young timber begins to sprout, particularly such as is produced by winged seeds, as cottonwood, sycamore, etc. Where the soil is either too

poor or too wet to produce a heavy annual growth of grass sufficient to make a strong fire, there is no prairie."

J. W. Foster, in "The Mississippi Valley" (1869) states,

"That these great changes in the geographical distribution of plants under nearly equal lines of temperature are due to the variable supplies of moisture, and that in the winds, as the agent in the distribution of that moisture, we have an adequate cause to explain all of the phenomena of forest, prairie, and desert."

Professor Rolfe kindly gives a resume of knowledge on this subject, but not in his words, as follows:-

As the glaciers receded and melted, they left lakes behind the moraines. These lakes, gradually lowering in level, soon offered opportunities for plant growth on the emerged soil. This was quickly covered by grasses and sedges, which extended into the lake, built up the surface deposit of vegetable mold, constituting the present prairie soil. Trees could not get a foot-hold among these rank and rapidly growing plants. As the water receded further drainage systems were formed by erosion, and along their streams the black soil was more or less washed away, exposing the clay subsoil. On this the prairie vegetation was thinner, and trees and shrubs gained a foot-hold. Being of a lower level, the soil contained more water, and the vegetation remained green until late in the season, so that the fires which swept the prairie every autumn did but little harm to the forests, but at the same time prevented their spreading out upon the prairie.

The first glacier that came down from the north, the Kansan glacier, producing the prairies of the Kansan drift, probably did not touch Illinois. Then the Illinoisan glacier covered Illinois

as far south as Jackson county, and caused the formation of immense prairies covering probably most of the state. Next came the Iowan glacier, which in this state extended only over the north-west corner. This was followed by the Wisconsin glaciers, which extended south as far as Edgar, Coles, Shelby, Macon, and Peoria counties. All the prairies north of this line were formed behind the moraines of the Wisconsin glaciers. An immense time elapsed between the Illinoisan glacier, forming the Illinoisan drift, and the Wisconsin glaciers forming the prairies of the Wisconsin drift. The drift south of Coles and Shelby counties and extending to Jackson is about three times as old as the drift north of those counties. Throughout this southern region, the original black prairie soil has been almost entirely washed away by water-action, exposing the subsoil of clay. In the northern prairies, which are comparatively young, the clay is still covered with the black vegetable mold to a depth of from two to eight feet.

In summary it may be said that the prairies were formed behind the moraines as a result of plant-growth and water-action, that they were perpetuated by water action and annual fires, and that they are being destroyed by water-action.

The character of the prairie soil is a rich black mould from two to eight feet deep, over a subsoil of yellow clay. It is rich in organic matter, and nitrates, and is capable of cultivation for many years without the application of fertilizers. Throughout the southern portion of the state the soil is deficient in organic matter and is lighter in color from this cause as well as from the increased proportion of clay. This may be due either to denudation of the original prairie mold, or as suggested by Professor Burrill. to

the more nearly complete oxidation of the organic matter. Whatever the cause, the difference in the soil, as shown by the plants growing upon it, is very marked.

It is certain that the physical characters of the prairie sod had much to do with the prevention of tree growth on the prairie. The grass roots were so closely and so compactly interwoven as to effectually prevent seedlings of trees from gaining a permanent foothold. Conditions similar to this may be seen at the present day, where a close sod prevents the growth of the seedlings, which, however grow vigorously where the sod has been destroyed. The vacant lots along East Green Street in Champaign are mostly covered with a close heavy blue-grass sod. In some places this sod has been disturbed or destroyed, and such places are thickly overgrown with young ash trees. The light winged seeds of this tree, coming from the rows along Green Street have been scattered over all of the lots, but have been able to grow only where the sod was destroyed.

One who has never seen immense tracts of unbroken prairie land cannot attempt a description of the prairies in their original condition. The sea-like expanses of thousands of acres are gone; they are covered with corn fields and dotted with cities. The writer of this thesis can give an idea of them only by copying from an author of sixty years ago.

From "Notes on the Western States," by James Hall. (1838.)

"The scenery of the prairie country excites a different feeling. The novelty is striking, and never fails to cause an exclamation of surprise. The extent of the prospect is exhilarating. The outline of the landscape is sloping and graceful. The verdure and the flowers are beautiful, and the absence of shade, and consequent

appearance of a profusion of light, produces a gaiety which animates the beholder.

"The attraction of the prairie consists in its extent, its carpet of verdure and flowers, its undulating surface, its groves, and the fringe of timber by which it is surrounded. Of all these, the latter is the most expressive feature---it is that which gives character to the landscape,which imparts the shape, and marks the boundary of the plain. If the prairie be small, its greatest beauty consists in the vicinity of the surrounding margin of woodland, which resembles the shore of a lake, indented with deep vistas like bays and inlets, and throwing out long points, like capes and headlands; while occasionally these points approach so close on either hand that the traveler passes through a narrow avenue or strait, where the shadows of the woodland fall upon his path,---and then emerges into another prairie. Where the plain is large, the forest outline is seen in the far perspective, like the dim shore, when beheld at a distance from the ocean. The eye sometimes roams over the green meadow, without discovering a tree, a shrub or any object in the immense expanse, but the wilderness of grass and flowers, while at another time, the prospect is enlivened by the groves, which are seen interspersed like islands, or the solitary tree, which stands alone in the blooming desert.

"In the summer, the prairie is covered with long coarse grass, which soon assumes a golden hue, and waves in the wind like a ripe harvest. Those who have not a personal knowledge of the subject, would be deceived by the accounts that are published of the height of the grass. It is seldom so tall as travellers have represented, nor does it attain its highest growth in the rich soil.

In the low wet prairies, where the substratum of clay lies near the surface, the center, or main stem of this grass, which bears the seed, acquires great thickness, and shoots up to the height of eight or nine feet, throwing out a few long coarse leaves or blades, and the traveler often finds it higher than his head as he rides through it on horseback. The plants, although numerous and standing close together, appear to grow singly and unconnected, the whole force of the vegetation power expanding itself upward. But in the rich undulating prairies, the grass is finer, with less of stalk, and a great profusion of leaves. The roots spread and interweave so as to form a compact, even sod, and the blades expand into a close thick sward, which is seldom more than eighteen inches high, and often less, until late in the season, when the seed-bearing stem shoots up.

"The first coat of grass is mingled with small flowers; the violet, the bloom of the strawberry, and others of the most minute and delicate texture. As the grass increases in size, these disappear, and others taller and more gaudy, display their brilliant colors upon the green surface, and still later a larger and coarser succession rises with the rising tide of verdure. A fanciful writer asserts that the prevalent color of the prairie flower is, in the spring a bluish-purple, in midsummer red, and in the autumn yellow. This is one of the notions that people get, who study nature by the fireside. The truthis, that the whole of the surface of these beautiful plains is clad throughout the season of verdure, with every imaginable variety of color, from grave to gay. It is impossible to conceive of a more infinite diversity, or a richer profusion of hues, or to detect any predominating tint, except the green which forms the beautiful ground, and releaves the exquisite brilliancy of all

others. The only changes of color observed at the different seasons, arise from the circumstances, that in the spring the flowers are small and the colors delicate; as the heat becomes more ardent a hardier race appears, the flowers attain a greater size, and the hue deepens; and still later a succession of coarser plants rise above the tall grass, throwing out larger and gaudier flowers. As the season advances from spring to midsummer, the individual flower becomes less beautiful when closely inspected, but the landscape is far more variegated, rich, and glooming.

"By those who have never seen this region, a very tolerable idea may be formed by the manner in which the prairie and forest alternate, and the rpoportion of each, by drawing a colored line of irregular breadth, along the line of all the water courses laid down in the map. The border thus shaded, which would represent the woodland, would vary in width from one to five or six miles, and would sometimes extend to twelve. As the streams approach each other the borders would approximate or come in contact, and all the intermediate spaces, not thus colored, would be prairie. It is true therefore, as a general rule, in relation to the states in which the prairies are situated, that wherever there is a considerable tract of surface, not intersected by water courses, it is level, and destitute of timber, but in the vicinity of springs and streams the country is clothed in forest."

But the original prairie from a botanical standpoint was evidently not so interesting as from the standpoint of the landscape, owing to the multiplication of individuals rather than species in any locality. The following quotation is from the "Catalogue of the

Plants of the State of Illinois" by I. A. Lapham, published in the transactions of the Illinois State Agricultural Society, volume 2, (1856-7.)

"Dr. C. W. Short of Louisville, Ky., has published in the Western Journal of Medicine for March, 1845, an account of his observations, (made in Autumn) on the flora of the prairies of Illinois. He traversed the central portions of the state, and returned by a different route, which gave him an opportunity of seeing and examining the face of the country and its productions under a great variety of aspects. Being an enthusiastic botanist and travelling in a light covered wagon well prepared for making extensive collections, his observations are a great value and add much to our knowledge of the peculiar vegetation of the central portions of the state. I cannot resist the temptation to copy a few of his very graphic descriptions: " In a geographical point of view, the surface of Illinois may be very appropriately, as it is naturally, divided into three districts. First---the heavy timbered tracts, which, for the most part, occupy the southern portion of the state bordering on the Ohio river, and which, extending into the middle and northern portions, are found in detached bodies, surrounded by prairies, and in these situations are called groves. These groves are, for the most part, contiguous to and often bounded by water courses, which have preserved them from the action of the fire. Secondly---the open prairies of from one to twenty miles in diameter, entirely destitute of trees, and indeed of all other woody plants, except along the margin of water courses which occasionly pervade them. Thirdly, the barrens or tracts somewhat intermediate between the two former being sparsely covered with oak trees of several different kinds and of

considerable size with a dense and annual plants. The vegetation of these three districts is, of course, essentially different; but apart from the presence or absence of trees, which constitute the grand feature of distinction, the animal and suffruticose plants are widely different and in many respects entirely dissimilar. Even the productions of the open prairie vary greatly as the surface of the prairie may be high, rolling, rich and dry, or low, flat, wet, and clayey.

" ' On fairly entering the prairie region, and reaching the center of one of those immense natural meadows, the view presented to the eye of a novice in such scenery is of the most pleasing sort. But beautiful, imposing and even grand as is this spectacle, I must own that, in a botanical point of view, I was disapointed. The flora of the prairies, the theme of so much admiration to those who view them with an ordinary eye, does not, when closely examined by the botanist, present that deep interest and attraction which he has been led to expect. Its leading feature is rather the unbounded profusion with which a few species occur, in certain localities, than the mixed variety of different species occuring everywhere. Thus from some elevated position in a large prairie, the eye takes in at a glance thousands of acres literally empurpled with the flowering spikes of several species of Liatris; in other situations, where a depressed or flattened surface and clayey soil favor the continuance of moisture, a few species of yellow flowered Coreopsis occur in such profuse abundance as to tinge the entire surface with a golden burnish. This peculiarity of an aggregation of individuals of one or more species to something like an exclusive monopoly of certain localities obtains even in regard to those plants which are the rarest and least frequently met with; for wherever one specimen

was found, there generally occured many more in the same immediate neighborhood. ' "

The writer's personal knowledge of unbroken prairie is limited to that gained from a short visit to a two acre tract in Macon county in August, 1899. It was left unbroken originally because a small creek expanded there into a slough, preventing cultivation, and it had remained in its original state for about thirty years since. The creek had been replaced by a tile, but the character of the plants showed that the soil was still wet.

It was thickly covered to a height of four feet with grasses, of which there were noticed four species, Spartina cynosuroides, Panicum virgatum, Andropogon furcatus, and Chrysopogon avenaceus. All were in bloom at the time. Mingled with these grasses and overtopping them were Solidago rigida, S. Canadensis, and S. serotina, about equally abundant, and underneath an abundance of Lythrum alatum. Polygonum Pennsylvanicum, Lacinaria cylindraces, and Cassia Chamaechista were common. A willow about three feet high, with silky leaves was also noticed.

Throughout central Illinois, at least, the growth of the prairie plants is now restricted to the land along fence-rows, roadsides and railways. But good farmers keep their fence-rows and roadsides free from "weeds", and many railroads are now renting the hitherto unused land on each side of the track to farmers for cultivation. The railways, also, commonly mow the plants along the right of way in July or August to prevent fires. So that, while the plants blooming and maturing before midsummer may still flourish, the later blooming plants suffer greatly and probably soon disappear. An instance of this is seen along the Illinois Central reilway south of

Champaign. Every spring a number of plants of Aster sericeus come up, but they have not been seen in bloom during four years. The right-of-way is mowed usually about the middle of July.

As yet, however, the members of the prairie flora can seldom be called rare, and it may safely be said that many species grow better now than on the uncleared prairie, being free from the competition of the heavy grass. The richest growth is at present usually found away from the patches of grass. The drier soil is seen pink with Brauneria, and the margins of sloughs red with Phlox, but in neither case were any grasses abundent enough to exert any influence on these plants. On the other hand stretches of roadside are sometimes overgrown with a second growth of rank grasses, and in such locations the representation of dicotyledons is comparatively scanty.

The future of the prairie flora? The more nearly all the land is brought into cultivation, the more neatly roadsides and railways are kept, the more the prairie plants will pisappear. Many will find themselves homes in the woods, as some have already done. Some will persist as weeds in cultivated lands. How many species will become extinct in Illinois can not be conjectured, but there will certainly be numbers of them. Cypripedium candidum and Nothocalais cuspidata are extinct in many regions. Dodecatheon Meadia and Gentiana puberula are less common each succeeding year.

The blooming time of the prairie plants depends on the heat and on the rainfall. It is fairly constant through the spring, but in summer the difference between blooming-times in successive years may be a month.

The following list shows the average date of blooming for a number of plants, based on observations made from 1896 to 1900.

Lithospermum canescens.	April	27.
Fragaria Virginiana,	"	28.
Ranunculus fascicularis,	"	"
Oxalis violacea,	"	29.
Carex Pennsylvanica,	May	1.
Viola pedatifida,	"	1.
Sisyrinchuim augustifolium,	"	2.
Dodecatheon Meadia,	"	3.
Hypoxis hirsuta,	"	5.
Comandra umbellata,	"	"
Zizia aurea,	"	8.
Phlox pilosa,	"	"
Senecio Balsamitae.	"	19.
Scutellaria parvula,	June	3.
Phlox glaberrima,	"	10.
Thaspium barbinode,	"	"
Rosa humilis,	"	12.
Asclepias obtusifolia,	"	14.
Anemone cylindrica,	"	15.
Lythrum alatum,	"	16.
Brauneria pallida,	"	"
Coreopsis palmata,	"	"
Amorpha canescens,	"	"
Parthenium integrifolium,	"	17.
Rudbeckia hirta,	"	"
Ruellia ciliosa,	"	18.

Acerates viridiflora ....June

Asclepias tuberosa,... ..... " 19.

Psoralea Onobrychis,..... "

Kuhnistera candida,..... ..... " 20.

Baptisia leucantha,..... ..... "

Desmodium Illinoense,... .... " 22.

Mesadenia tuberosa,.... .... "

Kuhnistera purpurea,..... .. . . " 25.

Beyond the first of July the blooming time is extremely variable on account of temperature and moisture, and averages are of no importance.

The first group of plants to appear in bloom may well be called the spring group. They are all low plants, many of them acaulescent , and generally with medium sized, delicate flowers,. In this section Phlox pilosa and Liphosperaum canescens are the most conspicious both in size and number. Dodecatheon Meadia has the most showy flowers, but it is becomming quite rare.

Throughout June, but especially about the middle of the month another set of plants comes into bloom. This may be called the early-summer group. Compositea and Leguminosae are the dominant factors. The plants are taller and coarses, with large flowers or with heads or clusters of small flowers. Brauneria pallida, Asclepias tuberosa, the Kuhnisteras, Rosa humilis and Lythrum alatum are among the most conspicuous in this group.

The mid-summer group appears in July. Lacinaria pycnostachya and the Silphiums are among the first of this group to appear.The plants are generally tall and coarse, with conspicuous, brightly colored flowers. They usually remain in bloom for a considerable period, often over a month. They are generally composite in

character, including such genera as Helianthus, Bidens, Coeopsis, Heliopsis, Silphium, Carduus, Solidago, Aster, Vernonia and Nabalus. Other orders are represented by Monarda, Leptandrs, Verbena, Cassia, Asclepias, Physostegia, and numerous gras es, Andropogon, Chrysopogon, Panicum, and Spartina being conspicuous.

This group emerges gradually into the autumn group of the latter part of September and October, in which Gentiana, Gerardia, and numerous species of Aster are the commonest.

The following list of prairie plants, containing over four hundred species, has been compiled from a number of sources:

1. The notes and observations of the writer, including about 250 species.

2. Catalogue of the Plants of Illinois, by H. N. Patterson.

3. Flora Peoriana, by F. Brendel.

4. The Flora of Cook County, Illinois, and a part of Lake County, Indiana, by W. K. Higley and C. S. Raddin.

5. The Natural History of La Salle County, part 1.---Botany, by J. W. Huett.

6. A list of the prairie plants of Stark County by V. J. Chase.

7. A list of the plants of Jackson County by Professor G. H. French.

8. The Native, Naturalized and Cultivated grasses of the State of Illinois, by I. A. Lapham.

9. Minorlists and notes from Dr. T. J. Burrill, Professor J. H. Coonradt of Decatur. Messrs J. W. Huett of Ottawa, G. P. Clinton of Urbana. C. G. Scott of Pecatonica, and R. G. Mills of Decatur.

The herbaria of the University of Illinois, of G. P.

Clinton, and of the writer have been consulted, together with some additional material furnished by Mr. V. H. Chase of Wadypetra, and Professor L. M. Umbach of Northwestern College at Naperville.

I desire to thank all these gentlemen for the help they have so generously given me.

Nomenclature and sequence, although hare regarded of secondary importance have been followed as in Britton and Brown's Illustrated Flora of the Northern United States and Canada. For convenience the names as given in Grays Manual are also given.

LIST OF THE PRAIRIE PLANTS OF ILLINOIS.

FAMILY 1. TYPHACEAE.

TYPHA L.

1. Typha latifolia L. Swamps and margins of ponds and streams throughout the state, frequent.

FAMILY 2. ALISMACEAE.

SAGITTARIA L.

2. Sagittaria latifolia Willd. (S. variabilis Engelm.) Edges of ponds and ditches, throughout the state; common, especially in bottom lands.

FAMILY 3. GRAMINEAE.

ANDROPOGON L.

3. Andropogon scoparius Michx. ~~Dry~~ Dry, especially sandy, prairies, common.

4. Andropogon furcatus Muhl. Dry prairies, common throughout the state. This is the "blue-joint" prairie grass.

CHRYSOPOGON TRIN.

5. Chrysopogon avenaceus (Michx) Benth. (C. nutans Benth. Man. Ed. 6, p. 638.) Dry prairies, common throughout the state. Also in dry open woods.

PANICUM L.

6. Panicum Scribnerianum Nash. (P. Scoparium Wats. in Gray, Man. Ed. 6, p. 632. Not scoparium Lam.) Prairies, common.

7. Panicum dichotomum L. Damp prairies and open woods, probably throughout the state.

8. Panicum depauperatum Muhl. Dry prairies, or dry open woods, throughout.

9. Panicum virgatum L. Moist or dry prairies , throughout.

10. Panicum capillare L. Dry prairies and sandy soil. A common weed in waste places. Appears as a weed on newly broken prairie.

11. Panicum autumnale Bosc. Dry sandy prairies and open woods. LeeCo. Vasey; Kankakee Co., Hill; Henderson Co., Patterson, and southward.

PHALARIS L.

12. Phalaris arundinacea. L. Borders of prairie marshes, Stark Co., Chase.

SAVASTANA SCHRANK. (Hierochloë Gmel.)

13. Savastana odorata (L.) Scribn. (Hierochloe borealis.R.&S.)
Wet prairies, Grundy Co., Brendel; LaSalle Co., Huett; Cook Co., Highly and Raddin; and northward.

ARISTIDA L.

14. Aristida ramo-sissima Engelm.
Dry prairies southward, St. Clair Co., Brendel; Wabash Co., Schneck and southward.

15. Aristida Oligantha Michx.
Henderson Co., Patterson; Champaign Co., and southward, dry sterile prairies.

16. Aristida tuberculosa Nutt.
Sandy soil probably throughout the state.

STIPA L.

17. Stipa spartea Trin.
Dry prairies, from Menard Co., Hall, Logan Co., and Champaign Co., northward.

MUHLENBERGIA SCHREB.

18. Muhlenbergia diffusa Schreb.
Rich prairies and open woods, throughout.

SPOROBOLUS R. BR.

19. Sporobolus longifolius (Torr.) Wood.
Dry prairies throughout. All the herbarium material labeled S. asper is referable to this species.

20. Sporobolus neglectus Nash.
Dry prairies, Champaign Co.; northern Illinois, Vasey. Formerly confused with S. vaginaeflorus.

21. Sporobolus vaginaeflorus (Torr.) Wood.
Fulton Co., Wolf, and probably southward.

22. Sporobolus heterolepis Gray.
Dry sandy prairie , frequent especially northward.

AGROSTIS L.

23. Agrostis hyemalis (Walt.) B. S. P. (A. scabra Willd.)
Dry prairies and openings in woods, throughout.

CALAMAGROSTIS ADANS.

24. Calamagrostis Canadensis (Michx.) Beauv.
Moist or wet prairies and swamps not rare,throughout.

SPARTINA SCHREB.

25. Spartina cynosuroides (L.) Willd.
Moist or wet prairies and along prairies ditches, common.

BOUTELOUA LAG.

26. Bouteloua hirsuta Lag.
Dry prairies, Lee Co., Vasey; Mason Co., Wolf (?); and westward.
27. Bouteloua oligostachya (Nutt.) Torr.
"Sansy prairies N. Dixon, Lee Co., Vasey"---Patterson. A Lee Co. from Vasey in Herb. U. of I. is however B. hursuta.
28. Bouteloua curtipendula (Michx.) Torr. (B. racemosa, Lag.)
Dry prairies, frequent.

SIEGLINGIA BERNH. (Triodia R. Br.)

29. Sieglingia seslerioides (Michx.) Scribn. (Triodia cuprea, Jacq.)
Dry prairies and barrens. Peoria Co., Brendel; Henderson Co., Patterson; and south.
30. Sieglingia purpurea (Walt.) Kuntze. (Triodia purpurea, Hack.)
Sandy prairies, Henderson Co., Patterson; Fulton, Wolf; Mason, Mead.

ERAGROSTIS BEAUV.

31. Eragrostis pectinacea (Michx.) Steud.
Prairies and sandy soil, throughout.

EATONIA RAF.

32. Eatonia obtusata (Michx.) Gray.
Dry prairies and open woods, frequent.
33. Eatonia Pennsylvanica (DC.) Gray.
Woods and rich prairies, frequent northward. I find no record of its occurance in southern Illinois.

KOELERIA PERS.

34. Koeleria cristata (L.) Pers.
Dry prairies, common.

MELICA L.
35. Melica mutica Walt.
Rich prairies and woods. Peoria Co., Brendel; LaSalle Co., Huett; Fulton Co., Wolf.

POA L.
36. Poa flava L. (P. serotina Ehrh.)
Sloughs and wet prairies, probably throughout.

PANICULARIA FABR. (Glyceria R. Br.)

37. Panicularia nervata(Willd.) Kuntze. (Glyceria nervata Trin.)
Wet prairies and low grounds, common.

FESTUCA L.

38. Festuca octoflora Walt. (F. tenella Willd.)
Dry or sandy prairies, throughout.

BROMUS L.

39. Bromus Kalmii Gray.
Dry woods and prairies, from Fulton Co., (Wolf.) Northward.

HORDEUM L.

40. Hordeum nodosum L. (H. pratense Huds.)
Dry prairies and wasteplaces , Hender son to La Salle Co., and southward.
41. Hordeum jubatum L.
Dry prairies and sandy soil, common.

ELYMUS L.

42. Elymus Canadensis L.
Rich prairies and along streams, common.

FAMILY 4. CYPERACEAE.

CYPERUS L.

43. Cyperus filiculmis Vahl.
Dry prairies and barrens.

ELEOCHARIS R. BR.

44. Eleocharis E ngelmanni Steud.
Wet prairies and marshes, Stark Co., Chase; opposite St. Louis, Engelmann;
45. Eleocharis palustris (L.) R. & S.
Wet prairies, etc. frequent.
46. Eleocharis Wolfii Gray.
Margins of ponds and wet prairies. Peoria, Fulton, Menard, and Stark Counties.
47. Eleocharis tenuis (Willd.) Schultes.
Wet prairies and sloughs, not rare.
48. Eloecharis acuminata (Muhl.) Nees. (E. compressa Sulliv.)
Wet prairies and bottoms, common.

FIMBRISTYLIS VAHL.

49. Fimbristylis castanea (Michx.) Vahl. (F. spadicea var. castanea Gray.)
Damp prairies, Cook Co., Higley and Raddin.

SCIRPUS L.

50. Scirpus lacustris L.
Marsh and pond borders, common.
51. Scirpus fluviatilis (Torr.) Gray.
Wet prairies and along streams, Fulton and Menard to Champign Co., and northward.
52. Scirpus atrovirens Muhl.
Wet prairies and sloughs, common.
53. Scirpus ~~lineatum Benth, & Hook~~ lineatus Michx. (Eriophorum lineatum Benth, & Hook.)
Wet prairies, bottom land, and along sloughs, common.

SCLERIA BERG.

54. Scelria triglomerata Michx.
Wet prairies and marshes, Peoria Co., Brendel; Cook Co., Higley and Raddin.

CAREX L.

55. Carex monile Tuckerm.
Edges of ponds and streams, mainly northward.
56. Carex lurida Wahl.
Wet prairies and bottom land.
57. Carex hystricina Muhl.
Low prairies and bottoms, throughout.
58. Carex aristata R. Br. (C. trichocarpa var, aristata Bailey.)
Wet prairies and edges of streams, northward.
59. Carex lanuginosa Michx. (C. filiformis var, latifolia Boeckl.)
Wet prairies and low grounds, common.
60. Carex fusca All.
Dry or wet prairies and marshes.
61. Carex Haydeni Dewey (C. stricta var, decora Bailey.)
Woods and low prairies, northward.
62. Carex conoidea Schkuhr.
Moist prairies, scarce; Cook Co., Higley and Raddin.
63. Carex Meadii Dewey. (C. tetanica var, Meadii Bailey.)
Dry or moist prairies, Champaign to Peoria County and northward.
64. Carex Richardsonii R. Br.
Dry prairies or sandy soil, Fulton and Menard Counties and northward.
65. Carex Pennsylvanica Lam.
Dry woods and prairies, common.
66. Carex Crawei Dewey.
Dry or rich prairies, frequent.

67. Carex stipata Muhl.
Wet prairies and low grounds, probably throughout.
68. Carex Crus corvi Shuttlew.
Swamps and low prairies, frequent.
69. Carex teretiuscula Gooden.
Wet prairies and sloughs, from Fulton Co., northward.
70. Carex vulpinoidea Michx.
Dry or moist prairies, common.
71. Carex xanthocarpa Bicknell.
Moist prairies, Stark Co., Chase, and probably much more widely distributed.
72. Carex Sartwellii Dewey.
Sandy prairies and boarders of sloughs, Menard Co., Hall; and northward.
73. Carex scoparia Sckuhr.
Moist prairies and bottoms, throughout.
74. Carex cristatella Britton. (C. tribuloides var, cristata Bailey.)
Moist prairies and low grounds, mainly northward.
75. Carex straminea Willd.
Wet prairies and bottoms, Stark Co., Chase; Peoria Co., Bendel; and northward.
76. Carex straminea mirabilis Tuckerm.
Wer or dry prairies and low grounds, common.
77. Carex festucacea Willd. (C. stramidea brevior, Dewey.)
Dry or usually wet prairies, throughout.

FAMILY 5, ARACEAE.

ACORUS L.

78. Acorus Calamus L.
Pond borders, swamps, and along streams, rare.

FAMILY 6, COMMELINACEAE.

TRADESCANTIA L.

79. Tradescantia Virginiana L.
Rich prairies, woods and thickets, common, throughout.
80. Tradescantia brevicaulus Raf.
Dry prairies and woods, Champaign and Piatt counties, and probably south.

FAMILY 7. JUNCACEAE.

JUNCUS L.

81. Juncus tenuis Willd.
Prairies, waste soil, and dry woods, common.
82. Juncus Torreyi Coville. (J. nodosus var. megacephalus Torr.)
Wet prairies and along sloughs, common northward.

83. Juncus brachycarpus Engelm.
Moist woods and prairies, scarce.
84. Juncus scripoides Lam.
Stark Co., marsh and pond borders, Chase.

FAMILY 8, MELANTHACEAE.

MELANTHIUM L.

85. Melanthium Virginicum L.
Damp prairies, infrequent,---Patterson.

FAMILY 9, LILIACEAE.

ALLIUM L.

86. Allium cernuum Roth.
Prairies, common from La Salle Co. (Forbes, Huett.) northward.
87. Allium Canadense L.
Moist prairies and open woods, common throughout.

NOTHOSCORDUM KUNTH.

88. Nothoscordum bivalve (L.) Britton. (N. striatum Kunth.)
Prairies and open woods. Fulton Co., Vasey, to Macon Co., and southward.

LILIUM L.

89. Lilium umbellatum Pursh. (L. Philadelphicum, Wats, in Gray, Man. Ed. 6, p. 529.)
Dry, often sandy prairies, throughout the state, but rare.
90. Lilium Canadense L.
Wet prairies and low grounds.
91. Lilium superbum L.
Bow rich prairies, probably throughout.

QUAMASIA RAF. (Camassia Lindl.)

92. Quamasia hyacinthina (Raf.) Britton. (Camassia Fraseri Torr.)
Dry woods and rich prairies, common.

FAMILY 10, AMARYLLIDACEAE.

HYPOXIS L.

93. Hypoxis hirsuta (L.) Coville. (Hypoxis erecta L.)
Dry open woods and dry prairies, common.

FAMILY 11, IRIDACEAE.

IRIS L.

94. Iris versicolor L.
Wet prairies and low grounds, common.

SISYRINCHIUM L.

95 Sisyrinchium graminoides Bicknell. (S. anceps, Wats, in Gray, Man. Ed. 6, p. 515.)
Moist prairies, Cook and LaSalle to Champaign Cos., and probably south.

96. Sisyrinchium angustifolium Mill.
Dry prairies and open woods, common.

FAMILY 12, ORCHIDACEAE.

CYPRIPEDIUM L.

97. Cypripedium candidum Willd.
Low, moist prairies, becoming v ry rare.

98. Cypripedium parviflorum Salisb.
Wet prairies and low woods, commoner at the north.

HABENARIA WILLD.

99. Habenaria leucophea (Nutt.) Gray.
Rich low prairies, throughout, scarce.

100. Habenaria psycodes (L.) Gray.
Wet prairies, La Salle Co., (Huett.) and northward, rare.

POGONIA JUSS.

101. Pogonia ophioglossoides (L.) Ker.
Wet prairies and swamps, Cook to LaSalle Co., and probably southward.

GYROSTACHYS PERS. (Spiranthes Rich.)

102. Gyrostachys cernua (L.) Kuntze. (S. cernua L.)
Damp prairies, probably throughout, but rare.

103. Gyrostachys gracilis (Bigel.) Kuntze. (S. gracilis Beck.)
Prairies and dry open woods and hillsides, throughout.

LIMNODORUM L. (Calopogon R. Br.)

104. Limnodorum tuberosum L. (C. pulchellus R. Br.)
Wet prairies and bogs, probably throughout.

FAMILY 13, SALICACEAE.

POPULUS L.

105. Populus deltoides Marsh. (P. monilifera Ait.)
Along streams and ponds, especially on prairies, common.

SALIX L.

106. Salix nigra Marsh.
Bottom lands and along streams, common.
107. Salix fluviatilis Nutt. (S. longifolia Muhl.)
Wet prairies and low grounds, throughout.
108. Salix discolor Muhl.
Wet grounds and along streams.
109. Salix humilis Marsh.
Wet or dry prairies, common, probably throughout.

FAMILY 14, SANTALACEAE.

COMANDRA NUTT.

110. Comandra umbellata (L.) Nutt.
Dry prairies, common.

FAMILY 15, POLYGONACEAE.

POLYGONUM L.

111. Polygonum Hartwrightii Gray.
Wet prairies, Stark Co., Chase, and northward.
112. Polygonum emersum (Michx.) Britton. (P. Muhlenbergii Wats.)
Swamps and wet prairies, Cook Co. to Stark Co., and probably more widely distributed.
113. Polygonum incarnatum Ell.
Wet prairies and low grounds common.
114. Polygonum lapathifoluim L.
Moist ground, common throughout.
115. Polygonum Pennsylvanicum L.
Moist prairies and low grounds, common.
116. Polygonum hydropiperoides Michx.
Wet soil, very common.
117. Polygonum punctatum Ell. (P. acre H. B. K.)
Swamps and wet prairies, frequent.
118. Polygonum ramosissinum Michx.
Usually on dry prairies, Champaign to Peoria Co., and northward.
119. Polygonum tenue Michx.
Dry prairies and hills, throughout
~~120.~~

FAMILY 16, PHYTOLLACCACEAE.

PHYTOLLACCA L.

120. Phytollacca decandra L.
Low grounds, woods and moist prairies, common.

FAMILY 17, NYCTAGINACEAE.

ALLIONIA LOEFL. (Oxybaphus L. Her .)

121. Allionia nyctaginea Michx. (Oxybaphus nyctaginus Sweet.)
Dry ground throughout, but not common,.

FAMILY 18, PORTULACACEAE.

TALINUM ADANS.

122. Talinum rugospermum Holz.
Sandy prairies, local through the northern counties. Ogle, Lee, Henderson an d LaSalle. Listed in all literature as T. teretifolium Pursh.

FAMILY 19, CARYOPHYLLACEAE.

SILENE L.

123. Silene antirrhina L.
Dry sandy pr iries and dry woods.

FAMILY 20, RANUNCULACEAE.

CALTHA L.

124. Caltha palustris L.
Wet prairies and low grounds, Fulton Co., (Wolf.) to Macon and Champaign Co. and northward.

DELPHINIUM L.

125. Delphinium Carolinanum Walt. (D. azureum Michx.)
Dry prairies and upland woods. Hancock and Henderson counties, Patterson; Macon Co, rare.
126. Delphinium tricorne Michx.
Dry woods and prairies, probably throughout , though reported only from the central portion.

ANEMONE L.

127. Anemone Caroliniana Walt.
Dry sandy prairies, rare, Cook to Peoria Co., and probably southward.
128. Anemone cylindrica Gray.
Dry, especially sandy prairies, comm on.
129. Anemone Virginiana L.
Dry woods, and moist prairies, common throughout.
130. Anemone Canadensis L. (A. Pennsylvanica L.)
Moist prairies and river bottoms, common.

PULSATILLA ADANS.

131. Pulsatilla hirsutissima (Pursh) Britton. (Anemone patens Nuttalliana Gray.)
Dry prairies and rocky hillsides, Cook Co., and westward.

CLEMATIS L.

132. Clematis Simsii Sweet. (C. Pitcheri T. and G.)
Low prairies and bottoms,. Will Co., to Henderson Co., and southward.

MYOSURUS L.

133. Myosurus minimus L.
Damp, sandy, prairies, Cook Co. to Hancock, Mead; and common southward.

RANUNCULUS L.

134. Ranunculus ovalis Raf.
Prairies, McHenry to Winnebago Co.
135. Ranunculus septentrionalis Poir.
Moist prairies and woods, common.
136. Ranunculus fascicularis Muhl.
Dry sandy prairies and open upland woods, common.

THALICTRUM L.

137. Thalictrum purpurascens L.
Rich woods and bottoms and wet prairies, common throughout.

FAMILY 21, CRUCIFERAE.

CARDAMINE L.
138. Cardamine bulbosa (Schreb.) B. S. P. (C. rhomboidea DC.)
Grassy bottom lands and wet prairies, common throughout.

SOPHIA ADANS.

139. Sophia incisa (Engelm.) Greene.
Dry prairies, LaSalle and Peoria to Macon Co., westward, and probably southward. Sisymbrium canescens Nutt. in Gray, Man. Ed.6.

ARABIS L.

140. Arabis laevigata (Muhl.) Poir.
Prairies and woods, throughout, rare.

ERYSIMUM L.

141. Erysimum asperum DC.
Dry sandy prairies, Mason and Cass counties, rare

FAMILY 22, DROSERACEAE.

DROSERA L.

142. Drosera rotundifolia L. Damp prairies, Cook Co.

FAMILY 23, CRASSULACEAE.

PENTHORUM L.

143. Penthorum sedoides L.
Wet prairies, ditches and bottoms. common throughout.

FAMILY 24, SAXIFRAGACEAE.

SAXIFRAGA L.

144 Saxifraga Pennsylvanica L. (Incl. S. Forbesii Vasey.)
Swamps and wet prairies, from Peoria Co. northward, and in southern I llinois.

HEUCHERA L.

145. Heuchera hispida Pursh.
Dry woods, hillsides and prairies, from Marion Co. (Bebb.) northward.

PARNASSIA L.

146. Parnassia Caroliniana Michx.
Bottom lands and damp prairies, Marion Co., and northward, rare.

FAMILY 25, ROSACEAE.

SPIRAEA L.

147. Spiraea salicifolia L.
Moist prairies and sloughs, not common.
148. Spirea tomentosa L.
Damp prairies and bottom lands, rare.

FRAGARIA L.

149. Fragaria Virginiana Duchesne. (Incl. F. Virginiana Illinoensis Prince.)
Dry or rich prairies, and open woods, common throughout.

POTENTILLA L.

150. Potentilla arguta Pursh.
Dry prairies, Menard Co., (Hall.) to Macon and Champaign and northward, not common.

152. Potentilla Canadensis L.
Dry prairies, and dry open woods, common throughout.
151. Potentilla Monspeliensis L.
Dry, especially clay soil, common throughout.

GEUM L.

153. Geum Virginianum L.
Moist prairies and woods, from Peoria Co., northward and not common.

ULMARIA HILL.

154. Ulmaria rubra Hill. (Spiraea lobata Gronov.)
Wet prairies and bottoms, from La Salle (Huett.) to Cass Co., (Mead.) rare.

ROSA L.

155. Rosa setigera Michx.
Dry or damp prairies and thickets. Stark to La Salle Co., and southward.
156 Rosa blanda Ait.
Prairies and sandy soil from Peoria Co. to Cook Co.
157. Rosa humilis Marsh.
Edges of woods and exceedingly common on prairies.

FAMILY 26, DRUPACEAE.

PRUNUS L.

158. Prunus serotina Ehrh.
Uplands woods and prairies, common. Doubtful if native on the prairie.

FAMILY 27, MIMOSACEAE.

ACUAN MED. (Desmanthus Willd.)

159. Acuan Illinoensis (Michx.) Kuntze. (Desmanthus brachylobus Benth.)
Sandy prairies and river banks, Kankakee to LaSalle Co., a and southward, rare.

FAMILY 28, CAESALPINIACEAE.

CASSIA L.

160. Cassia Chamaechrista L.
Prairies and sandy soil, very common.

FAMILY 29, PAPILIONACEAE.

BAPTISIA VENT.

161. Baptisia tinctoria (L.) R. Br.
Dry prairies, not reported from south of Macon Co.
162. Baptisia Bracteata Ell. (Baptisia leucophaea Nutt.)
Dry prairies and open woods, throughout but not common.
163. Baptisia leucantha P. & G.
Dry or moist prairies and edges of woods, common.

TRIFOLIUM L.

164. Trifolium reflexum L.
"Prairies," Cook Co., and probably throughout.

PSORALEA L.

165. Psoralea tenuiflora Pursh.
Dry prairies, from Cook and LaSalle counties to Menard Co., and westward.
166. Psoralea floribunda Nutt.
"Prairies, Illinois," Britton and Brown.
167. Psoralea pedunculata (Mill.) Vail.
Prairies and dry soil, Marion Co., and southward.
168. Psoralea Onobrychis Nutt.
Dry woods and prairies, Kankakee to Peoria Co., and southward, common.

AMORPHA L.

169. Amorpha fruticosa L.
Along streams, low woods and damp prairies, common.
170. Amorpha canescens Pursh.
Dry prairies, common.

KUHNISTERA LAM. (Petalostemon Michx.)

171. Kuhnistera candida (Willd.) Kuntze. (P. Candidus Michx.)
Dry prairies, common.
172. Kuhnistera purpurea (Vent.) Mac M. (P. violaceus Michx.).
Dry prairies, growing with K. candida, and usually more abundant.

CRACCA L. (Tephrosia Pres.)

173. Cracca Virginiana L. (T. Virginiana Pers.)

Dry and sandy ~~xxx~~ prairies, throughout, but rare.

ASTRAGALUS L.

174. Astragalus Plattensis Nutt.
Dry prairies and river banks, rare. Will Co., Vasey; Ogle Co., Bebb; LaSalle Co., Huett.

175. Astragalus Carolinianus L. (A. Canadensis L.)
Dry or moist prairie, dry woods, and river banks, common, throughout.

176. Astragalus Mexicanus A. DC.
"Prairies "---Brotton and Brown. Madison and St.Clair counties.

177. Astragalus distortus T. & G.
Prairies, Mason and Menard counties.

MEIBOMIA ADANS. (Desmodium Desv.)

178. Meibomia Illinoensis (A. Gray) Kuntze. (D. Illinoense Gray.)
Dry prairies, common from Marion Co. (Bebb.) northward.

179. Meibomia Canadensis)L.) Kuntze. (D. Canadense DC.)
Dry prairies and open woods, common.

LESPEDEZA MICHX.

180. Lespedeza violacea (L.) Pers.
Dry woods thickets and prairies, rare as a prairie plant.

181. Lespedeza capitata Michx.
Dry prairies, common.

182. Lespedeza leptostachya Engelm.
Prairies, especially northward.

LATHYRUS L.

183. Lathyrus palustris L.
Damp prairies and low grounds, not common.

FALCATA GMEL. (Amphicarpa Ell.)

184. Falcata Pitcheri (T. & G.) Kuntze.
Moist prairies and woods, from Stark Co. (Chase.) southward.

STROPHOSTYLES ELL.

185. Strophostyles helvola (L.) Britt. (S. angulosa Ell.)
Dry prairies, dry woods, and sandy river banks, common, especially southward.

FAMILY 30, GERANIACEAE.

GERANIUM L.

186. Geranium Carolinianum L.
Dry and sandy prairies, throughout the state, but not common.

FAMILY 31, OXALIDACEAE.

OXALIS L.

187 Oxalis violacea L.
Dry prairies and upland woods, common.

188. Oxalis stricta L. (O. corniculata stricta Sav.)
Very common in all situations.

FAMILY 32. LINACEAE.

LINUM L.

189. Linum sulcatum Riddell.
Prairies and dry woods, throughout, but not common.

FAMILY 33, POLYGALACEAE.

POLYGALA L.

190. Polygala verticillata L.
Dry prairies and sandy soil, throughout.
191. Polygala viridescens L. (P. sanguinea L.)
Dry prairies and open woods, frequent.
192. Polygala incarnata L.
Dry prairie, Peoria Co., Brendel.
193. Polygala Senega L.
Rich woods and prairies, common.
194. Polygala polygama Walt.
Damp prairies and sandy soil, Cass Co., (Mead.) and northward.

FAMILY 34, EUPHORBIACEAE.

CROTON L.

195. Croton capitatus Michx.
Dry prairies, and sandy soil. Menard Co., (Hall) and common southward.

EUPHORBIA L.

196. Euphorbia Geyeri Engelm & Gray.
"Sandy prairies and barrens of Menard, Mason, and Cass counties; Henderson; Lee, Vasey."---Patterson.

197. Euphorbia nutans Lag. (E. Preslii Guss.)
In all situations, common.
198. Euphorbia corollata L.
Dry open woods and prairies, common.
199. Euphorbia Dentata Michx.
Rich prairies and woods, Henderson to La Salle and Champaign counties, and common southward.

FAMILY 35, RHAMNACEAE.

CEANOTHUS L.

200. Ceanothus Americanus L.
Prairies and dry open woods, common.

201. Ceanothus ovatus Desf.
Prairies and rocky hills, Winnebago Co., Bebb.

FAMILY 36, MALVACEAE.

CALLIRRHOE NUTT.

202. Callirrhoë triangulata (Leaveny.) A Gray.
Dry prairies, especially in sandy soil, Cook to Cass counties, and probably throughout.

FAMILY 37, HYPERICACEAE.

HYPERICUM L.

203. Hypericum sphaerocarpum Michx.
Prairies and hillsides, throughout, infrequent.
204. Hypericum maculatum Walt.
Moist soil, very common.
205. Hypericum mutilum L.
Moist prairies and woods, not common.

FAMILY 38, CISTACEAE.

HELIANTHEMUM PERS.

206. Helianthemum majus (L.) B. S. P.
Dry sandy prairie, Champaign Co.
207. Helianthemum Canadense (L.) Michx.
"Dry prairies and barrens common"---Patterson. This may be referable to H. majus, but in the absence of definite information will be listed separately.

LECHEA L.

All the following species prefer dry soil, especially open woods.
209. Lechea tenuifolia Michx.
208. Lechea villosa Ell. (L. major Michx.)
210. Lechea Leggettii Britt, & Hall. (L. minor Lam.)
211. Lechea stricta Leggett.

FAMILY 39, VIOLACEAE.

VIOLA L.

212. Viola pedatifida Don.
Dry prairies, throughout, common.
213. Viola sagittata Ait.
Dry prairies and woods, frequent.
214. Viola pedata L.
Dry prairies and sandy woods, throughout.

FAMILY 40? LOASACEAE.

MENTZELIA L.

215. Mentzelia oligosperma Nutt.
"Prairies, Pike Co., Mead."---Patterson.

FAMILY 41, LYTHRACEAE.

LYTHRUM L.

216 Lythrum alatum Prush.
Wet prairies, throughout, common.

PARSONSIA P. BR. (Cuphea P. Br.)

217. Parsonsia petiolata (L.) Rusby. (Cuphea viscosissima Jacq.)
Prairies and dry woods, Cook to La Salle and Peoria countie and very common in the southern part of the state.

FAMILY 42, MELASTOMACEAE.

RHEXIA L.

218. Rhexia Virginica L.
Wet sandy prairie and swamps, Lee Co., (Vasey.) to Kankakee Co., (Hill) and southward, rare.

FAMILY 43, ONAGRACEAE.

EPILOBIUM L.
219. Epilobium coloratum Muhl.
Wet prairies and low ground, frequent.

ONAGRA.

220. Onagra cruciata (Nutt.) Small. (Oenothera biennis cruciata T. & G.)
Prairies, Cook Co., Higley and Raddin.

221 Onagra biennis (L.) Scop. (Oenothera biennis L.)
In all situations, common.

ONEOTHERA L.
222. Oenthera rhombipetala Nutt.
Dry and sandy prairies, rare.

KNEIFFIA SPACH.

223. Kneiffia fruticosa (L.) Raimann. (Oenothera fruticosa L.)
Moist or wet prairies, throughout but infrequent.

GAURA L.
224. Gaura biennis L.
Prairies, throughout, common.

FAMILY 44, UMBELLIFERAE.

OXYPOLIS RAF. (Tiedemannia DC.)

225. Oxypolis rigidus)L.) Britton. (Tiedemannia rigida Coult & Rose.)
Wet prairies and swamps, rare.

POLYTAENIA DC.

226. Polytaenia Nuttallii DC.
Dry prairies, throughout, but rare.

THASPIUM NUTT.

227. Thaspium barbinode)Michx.) Nutt.
Rich prairies and woods, infrequent.

ERYNGIUM L.

228. Eryngium aquaticum L. (E. Yuccaefolium Michx.)
Dry or damp prairies, common.

EULOPHUS NUTT.

229. Eulophus Americanus Nutt.
Dry prairies and woods, rare.

SIUM L.

230. Sium cicutaefolium Gmel.
Swamps and wet prairies, frequent.

ZIZIA KOCH.

231. Zizia aurea (L.) Koch.
Dry or rich prairies, and rich woods, common.

CICUTA L.

232. Cicuta maculata L.
Swamps and wet prairies, very common.

FAMILY 45. PRIMULACEAE.

ANDROSACE L.

233. Androsace occidentalis Pursh.
Sandy prairies and hillsides, Fulton Co., (Wolf) to Kan kakee Co., (Hill) and northward.

STEIRONEMA RAF.

234. Steironema lanceolatum (Walt.) A. Gray.
Moist prairies, swamp and bottom lands, frequent.

235. Steironema quadriflorum (Sims) Hitchc.
Moist prairies and along prairie ditches, Menard to Champaign counties and northward.

DODECATHEON L.

236. Dodecatheon Meadia L.
Rich prairies and edges of woods, becomming ~~common~~ rare.

FAMILY 46, GENTIANACEAE.

GENTIANA L.

237. Gentiana quinquefolia L. (G. quinqueflora Lam.)
Wooded hillsides and moist prairies, rare as a prairie ~~pla~~ plant.
238. Gentiana puberula Michx.
Dry prairies, becomming rare.
239. Gentiana Andrewsii Griseb.
Moist prairies and bottoms, common.
240. Gentiana flavida A. Gray. (G. alba A. Gray in Man.)
Open woods, low groungs, and rich prairie, rare.

FAMILY 47, APOCYNACEAE.

APOCYNUM L.

241. Apocynum cannabinum L.
In nearly all situations, common.
242. Apocynum hypericifoluim Ait.
Prairies and dry soil, probably throughout.

FAMILY 48, ASCLEPIADACEAE.

ASCLEPIAS L.

243. Asclepias tuberosa L.
Dry prairies, common.
244 Asclepias incamata L.
Swamps, bottoms and wet prairie, common.
245. Asclepias Sullivantii Engelm.
Low, or wet prairie, common.
246. Asclepias obtusifolia Michx.
Dry, especially sandy, prairies, not common.
247. Asclepias Meadii Torr.
Dry or sandy prairie, rare.
248. Asclepias exaltata (L.) Muhl. (A. phytollaccoides Pursh.)
Rich woods and moist prairies, frequent.
249. Asclepias Syriaca L. (A. Cornuti Dec.)
Prairies, woods and bottoms, common.
250. Asclepias ovalifolia Dec.
Prairies, from Champaign Co., northward, rare.
251. Asclepias verticillata. L.
Dry woods and sandy prairies, common.

ASCLEPIODORA A. GRAY.

252. Asclepiodora viridis (Walt.) A. Gray.
Prairies from McLean and Macon counties (Miss Holmes) southward.

ACERATES ELL.

253. Acerates viridiflora (Raf.) Eaton.
Dry prairies and upland woods, frequent.
254. Acerates Floridana (Lam.) Hitchc. (Acerates longifolia Ell.)
Dry or moist prairies, common.
255. Acerates lanuginosa (Nutt.) Dec.
"Prairies, Winnebago Co., Bebb; Mc Henry Co., Vasey."---Patterson.

FAMILY 49, CONVOLVULACEAE.

IPOMOEA L.

256. Ipomoea pandurata (L.) Meyer.
Dry woods and bottoms from LaSalle Co. southward, and common on prairies in the southern part of the state.

CONVOLVULUS L.

257. Convolvulus sepium L.
Prairies, open woods and bottoms, common.

FAMILY 50, CUSCUTACEAE.

CUSCUTA L.

258. Cuscuta arvensis Beyrich.
On small prairie herbs, frequent.
259. Cuscuta indecora Choisy.
Low prairies, from Fulton and Menard counties southward.
260, Cuscuta paradoxa Raf. (C. Glomerata Choisy.)
On tall prairie Compositae, especially Helianthus, common.

FAMILY 51, POLEMONIACEAE.

PHLOX L.

261. Phlox maculata L.
Moist prairies and rich woods, rare.
262. Phlox glaberrima L.
Moist or wet prairies, common.
263. Phlox pilosa L.
Dry prairies, common.
264. Phlox divaricata L.
Rich woods and moist prairies, common.

265. Phlox bifida Beck.
Sandy prairies and woods, throughout but infrequent.

POLEMONIUM L.

266. Polemonium reptans L.
Rich woods, and moist prairies, common.

FAMILY 52, HYDROPHYLLACEAE.

MACROCALYX TREV. (Ellisia L.)

267. Macrocalyx Nyctelea (L.) Kuntze. (Ellisia Nyctelea L.)
Woods, and moist prairies, common.

FAMILY 53, BORAGINACEAE.

LITHOSPERMUM L.

268. Lithospermum Gmelini (Michx.) A. S. Hitchc. (L. hirtum Lehn.)
Dry prairies and dry open woods, frequent.
~~268.~~
269. Lithospermum canescens (Michx.) Lehm.
Dry prairies and open upland woods, common.
270. Lithospermum angustifolium Michx.
Dry ~~wood~~ or rich prairies and open woods, not common.

FAMILY 54, VERBENACEAE.

VERBENA L.

271. Verbena Hastata L.
Moist prairies, bottom land, and waste places, common.
272. Verbena angustifolia Michx.
In dry soil, throughout , but uncommon.
273. Verbena stricta Vent.
Dry or moist and waste places, common.
274. Verbena bracteosa Michx.
Dry, and especially sandy soil throughout.

LIPPIA L.

275. Lippia lanceolata Michx.
Wet prairies, sloughs and bottoms, common throughout.

FAMILY 55, LABIATAE.

TEUCRIUM L.

276. Teucrium Canadense L.
Rich woods, bottoms and wet prairies, common throughout.
277. Teucrium occidentale Gray.
Wet prairie St ark (Chase.) and Champaign counties.

SCUTELLARIA L.

278. Scutellaria parvula Michx.
Moist prairies, especially in loose soil such as railroad embankments, frequent.

PRUNELLA L.

279. Prunella vulgaris L.
Woods, hillsides, and moist prairie, common.

PHYSOSTEGIA BENTH.

280 Physostegia Virginiana (L.) Benth.
Wet prairies, bottoms and along water courses, common.

MONARDA L.

281. Monarda fistulosa L.
DRy or rich prairies, and open woods, throughout, common.

KOELLIA MOENCH. (Pycnanthemum Michx.)

282. Koellia flexuosa (Walt.) Mac M. (P. linifolium Pursh.)
Dry open woods and prairies, not common.
283. Koellia Virginiana (L.) Mac M. (P. lanceolatum Pursh.)
Dry or r ich prairies and upland woods, common.
284. Koellia pilosa (Nutt.) Britton. (P. muticum var. pilosum Gray.)
Open upland woods and prairies, common from Henderson and Kankakee counties southward.

LYCOPUS L.

285. Lycopus Virginicus L.
Wet prairies, sloughs, and bottoms, common.
286. Lycopus Americanus Muhl. (L. sinuatus Ell.)
Wet prairies and bottoms, common.

MENTHA L.

287. Mentha Canadensis L.
Wet prairies, swamps and bottoms, common.

FAMILY 56, SOLANACEAE.

PHYSALIS L.

288. Physalis lanceolata Michx.
Sandy prairies, frequent.
289. Physalis heterophylla Nees.
Dry prairies and open woods, common.

SOLANUM L.

290. Solanum nigrum L.
Moist shaded soil, and waste places, common.
291. Solanum Carolinense L.
Dry woods, prairies, and waste ground, from Cook Co. to Henderson Co., and southward, common.

FAMILY 57, SCROPHULARIACEAE.

LINARIA JUSS.

292. Linaria Canadensis (L.) Dumort.
Dry sandy soil, throughout, but rare.

CHELONE L.

293. Chelone glabra L.
Moist prairies, bottoms, and along streams, frequent.

PENTSTEMON SOLAND.

294. Pentstemon hirsutus (L.) Willd. (P. Pubescens Soland.)
Dry wooded hillsides, and dry sandy prairies, not common.

CONOBEA AUBL.

295. Conobea multifida (Michx.) Benth.
Along streams, common from Stark and La Salle counties, southward.

GRATIOLA L.

297. Gratiola sphaerocarpa Ell.
In similar situations, from Henderson county southward.

~~ILYSANTHES~~ RAF.

296 Gratiola Virginiana L.
Wet prairies, swamps and bottoms, common.

ILYSANTHES RAF.

298. Ilysanthes gratioloides)L.) Benth. B (I. riparia Raf.)
Borders of ponds and streams, common.

WULFENIA JACQ. (Synthyris Benth.)

299. Wulfenia Houghtoniana (Benth.) Greene. (S. Houghtoniana Benth.)
Dry prairies, from Menard Co. northward, rare.

LEPTANDRA NUTT. ~~(Veronica Virginica Lx)~~x
300. Leptandra Virginica (L.) Nutt. (Veronica Virginica L.)
Upland woods and dry prairies, common.

GERARDIA L.

301. Gerardia asper Dougl.
Moist or dry prairies, probably throughout, but rare.
302. Gerardia paupercula (Gray.) Britt. (G. purpurea paupercula Gray.)
Moist prairies and bottoms from Stark Co., northward.
303. Gerardia tenuifolia Vahl.
Rich woods, bottoms and moist prairies, common.
304. Gerardia auriculata Michx.
Moist or dry prairies, not common.

CASTILLEJA MUTIS.

305. Castilleja coccinea (L.) Spreng.
Open woods upland, and rich prairies, becoming rare.
306. Castilleja sessiliflora Pursh.
Prairies and rocky woods from La Salle Co. (Huett.) northward.

PEDICULARIS L.

307. Pedicularis lanceolata Michx.
Moist or wet prairies and swamps, frequent.
308. Pedicularis Canadensis L.
Dry upland woods, and dry prairies, common

FAMILY 58, ACANTHACEAE.

RUELLIA L.

309 Ruellia ciliosa Pursh.
Dry upland woods and hills, and dry prairies, abundant.

FAMILY 59, PLANTAGINACEAE.

PLANTAGO L.

310. Plantago Rugelii. Dec. (P. major. of authors.)
Prairies, woods, and waste places, common.
311. Plantago aristata Michx. (P. Patagonica aristata Gray.)
Dry prairies, from Peoria Co., southward and westward.

FAMILY 60, RUBIACEAE.

HOUSTONIA L.

312. Houstonia longifolia Gertn. (H. purpurea longifolia Gray.)
Prairies and dry woods, frequent.
313. Houstonia purpurea calycosa Gray.
Prairies, Macon Co. wooded hillsides, Champaign Co., rare.

DIODIA L.

314. Diodia teres Walt.
Prairies and waste ground, from Hancock to Coles counties and common southward.

GALIUM L.

315. Galium tinctorium L. (G. Trifidum latifolium Torr.)
Moist prairies and low groungs, Stark & and Cook counties.
316. Galium concinnum Torr. & Gray.
"Dry prairies" Patterson; and common in woods.

FAMILY 61, VALERIANACEAE.

VALERIANA L.

317. Valeriana edulis Nutt.
Damp prairies, Cook to La Salle and Stark counties (Snare & Hicks) and northward.

FAMILY 62, CAMPANULACEAE.

CAMPANULA L.

318. Campanula apaintoides Pursh.
Swamps and wet prairies, not comm on.

LEGOUZIA DURAND. (Specularia Heist.)

319. Legouzia perfoliata)L.) Britton. (S. Perfoliata A. DC.)
Dry soil; woods, or prairies, common

LOBELIA L.

320. Lobelia syphilitica L.
Moist prairies and bottoms, common.
321. Lobelia spicata Lam.
Low or sandy prairie, common.
322. Lobelia leptostachys A. DC.
Prairies or dry woods, Stark Co., (Snare & Hicks) to Kankakee Co., and couthward.

FAMILY 63, CICHORIACEAE.

ADOPOGON NECK. (Krigia Schreb.)

323. Adopogon Virginicum (L.) Kuntze. (Krigia amplexicaulis Nutt.)
Open dry woods, hillsides and prairies, frequent.
324. Adopogon Carolinianum (Walt.) Britt.
DRy, sandy soil from La Salle Co., southward, common.

LACTUCA L.

325. Lactuca Canadensis L.
Rich soil, especially on prairies, common.

NOTHOCALAIS GREENE.
326. Nothocalais cuspidata (Pursh.) Greene.
Dry prairies, from Macon Co., northward, rare.

HIRACIUM L.

327. Hieracium longipilum Torr.
Dry prairies and open woods, rare.

NABALUS CASS.

328. Nabalus asper (Michx.) T. & G. (Prenanthes asper Michx.)
Dry prairies, throughout, common.
329. Nabalus racemosus (Michx.) T?.& G. (Prenanthes racemosa Michx.)
Rich low prairies, in the central and northern portions, common.

FAMILY 64, AMBROSIACEAE.

AMBROSIA L.

330. Ambrosia bidentata Michx.
Dry prairies, Peoria to Sangamon and Shelby counties and southward, common.
331 Ambrosia artemisiaefolia L.
Prairies, bottoms and waste places, everywhere common.
332. Ambrosia psilostachya DC.
Moist prairies and sandy soil, throughout, but infrequent.

FAMILY 65, COMPOSITAE.

VERNONIA SCHREB.

333. Vernonia fasciculata Mixchx.
Dry or moist prairies, and bottoms, very variable.
334. Vernonia Drummondii Shuttlew.
Dry prairies, common from Stark Co., (Chase) southward. (V. altissima grandiflora Gray.)

EUPATORIUM L.

335. Eupatoruim maculatum L. (E. Purpureum maculatum Darl.)
Moist pr iries and woods, Stark Co. (Chase) and probably throughout.
336. Eupatoruim altissimum L.
La Salle to Stark Co., (Snare and Hicks) and southward.
337. Eupatoruim perfoliatum L.
Wet soil, common.

KUHNIA L.

338. Kuhnia eupatorioides L.
Dry woods and prairies, common.
339. Kuhnia glutinosa Ell.
Dry prairies, rare.

LACINARIA HILL (Liatris Schreb.)

340. Lacinaria squarrosa (L.) Hill. (Liatris squarrosa Willd.)
Dry prairies and hills from Cook Co., southward, not common.
341. Lacinaria cylindracea (Michx.) Kuntze. (Liatris cylindracea Michx.)
Dry prairies, common.
342. Lacinaria pycnostachya (Michx.) Kuntze. (Liatris pycnostachya Michx.)
Dry or moist prairies, common.
343. Lacinaria scariosa (L.) Hill. (Liatris scariosa ~~(Kx)~~ ~~Hill~~ Willd.)
Dry prairies, sandy soil, and upland woods, common.
344. Lacinaria spicata (L.) Kuntze. (Liatris spicata Willd.)
Moist prairies, from La Salle county northward, infrequent.

GRINDELIA WILLD.

345. Grindelia sqnarrosa (Pursh.) Dunal.
Dry prairies, ~~xx~~ in the northern portion.

CHRYSOPSIS NUTT.

346. Chrysopsis camporum Greene.
"On prairies, Illinois,"---Britton & Brown.
347. Chrysopsis villosa (Pursh.) Nutt.
Dry prairies, rare.

SOLIDAGO L.

348. Solidago speciosa Nutt.
Prairiesm copses, and edges of woods, frequent.
349. Solidago rigiduiscula (T. & G.) Porter. (S. speciosa angustata Gray.)
Dry uplands woods and thickets and on prairie s, from Champaign Co. southward, frequent.
350. Solidago juncea.Ait.
Moist prairies and woods, common.
351. Solidago serotina Ait.
Rich prairies and moist open woods, common.
352. Solidago Missouriensis Nutt.
Dry prairies, common.
353. Solidago Canadensis L.
Prairies, edges of woods, and bottoms, common and very variable.
354. Solidago radula Nutt.
Dry prairies and upland woods, from La Salle Co. southward and westward.
354. Solidago nemoralis Ait.
Dry upland woods and pr airies, common.
356. Solidago rigida L.
Dry or moist prairies, common.
357. Solidago Ohioensis Riddell.
Moist or wet prairies, from La Salle and Peoria counties northward.

358. Solidago Riddellii Frank.
Wet prairies, common.

EUTHAMIA NUTT..

359. Euthamia graminifolia (L.) Nutt. (Solidago lanceolata L.)
Wet prairies and bottom lands, common at the north.
360. Euthamia Caroliniana (L.) Greene. (Solidago temifolia Pursh)
Dry prairies, common.

BOLTONIA L. HER.

361. Boltonia asteroides (L.) L'Her.
Wet prairies, swamps and bottomland, common.
362. Boltonia decurrens (T. & G.) Wood.
"In wet prairies "---Britton and Brown. Fulton Co., Wolf.
363. Boltonia diffusa Ell.
Prairies, Washington and St. Clair counties, and southward.

ASTER L.

364. Aster azureus Lindl.
Prairies and edges of woods, common.
365. Aster Novae---Angliae L.
Rich prairies and edges of upland woods, common.
366. Aster puniceus L.
Moist wet prairies, and bottoms, rare.
367. Aster laevis L.
Dry prairies, and open woods, common .
368. Aster sericeus Vent.
Dry, sandy prairies, becomming rare.
369. Aster turbinellus Lindl.
Dry upland woods and dry prairies, from Cook Co., southward.
370. Aster ptarmicoides (Nees.) T. & G.
Dry or sandy prairies, from Menard Co. northward, not common.
371. Aster dumosus L.
Dry prairies, woods and thickets, commonest at the south.
372. Aster ericoides L.
Dry soil. either pririe or woodland, frequent.
373. Aster ericoides parviceps Bugess.
"Prairies Illinois;"---Bugess in Britton & Brown.
374. Aster vimineus Lam.
Dry or moist prairies, edges of woods and bottoms, common.
375. Aster multiflorus Ait.
Dry prairies, common,

LEPTILON RAF.

376. Leptilon divaricatum (Michx.) Raf. (Erigeron divaricatum Michx.)
Dry prairies, throughout but infrequent.

DOELLINGERIA NEES.

377. Doellingeria umbellat (Mill.) Nees. (Aster umbellatus Mill.)
Moist woods and prairies, from Menard Co., (Hall.) northward.

IONACTIS GREENE.
378. Ionactis linarifolius (L.) Greene. (Aster linariifolius L.)
Dry and sandy prairies, throughout.

ANTENNARIA GAERTN.

379. Antennaria neglecta Greene.
Stark Co. , sterile prairie, (Chase.)

GNAPHALIUM L.
380. Gnaphalium obtusifolium L. (G. polycephalum Michx.)
Dry open woods, and dry prairies, frequent.

SILPHIUM L.

381. Silphium perfoliatum L.
Wet prairies, along ditches, and in river bottoms, common.
382. Silphium integrifoluim Michx.
Dry prairies, abundant.
383. Silphium laciniatum L.
Dry prairies very common.
384. Silphium terebinthinaceum Jacq.
Common on dry prairies.
385. Silphium terebinthinaceum pirinatifidum (Ell.) Gray.
Dry prairie, Champaign Co.

PARTHENIUM. L.

386. Parthenium integrifolium L.
Dry prairies, and edges of woods, common.

HELIOPSIS PRES.
387. Heliopsis scabra Dunal.
Dry prairies, dry woods, and thickets, common.

RUDBECKIA L.
388. Rudbeckia subtomentosa Pursh.
Damp prairies throughout, frequent.
389. Rudbeckia hirta L.
Dry priaires and woods, common.

RATIBIDA RAF. (Lepachys Raf.)

390. Ratibida pinnata (Vent.) Barnhart. (Lepachys pinnata Torr. & Gray.)
On dry prairies, common.

BRAUNERIA NECK. (Echinacea Moench.)

391. Brauneria purpurea (L.) Britton. (Echinacea purpurea Moench.)
Dry prairies and upland woods. Peoria Co., (Brendel.) and comm on southward.
392. Brauneria pallida (Nutt.) Britton. (Echinacea angustifolia DC.)
On dry pr airies, common.

HELIANTHUS L.

393. Helianthus scaberrimus Ell. (Helianthus rigidus Desf.)
Dry prairies, adundant.
394. Helianthus occidentalis Riddell.
Dry prairies, common.
395. Helianthus giganteus L.
Wet prairies, wet woods and botto lands, not comm n.
396. Helianthus grosse-serratus Martens.
Prairies and borders of woods, common.
397. Helianthus mollis Lam.
Dry prairies, common.
398. Helianthus hirsutus Raf.
Dry prairies and thickets, scarce.
399. Helianthus laetiflorus Pers.
Dry prairies, throughout, but infrequent.

VERBESINA L.

400. Verbesina helianthoides Michx.
"On dry prairies "---(Britton and Brown) and in upland woods, frequent.

COREOPSIS L.

401. Coreopsis palmata Nutt.
Common on dry prairies.
402. Coreopsis lanceolata L.
Rich, damp prairie, frequent.
403. Coreopsis tripteris L.
Rich or dry prairies and upland woods, common.

BIDENS L.

404. Bidens laevis (L.) B. S. P. (B. chrysanthemoides Michx.)
Wet prairies and bottoms, common.
405. Bidens comosa (Gray.) Wiegand.
Wet prairies, Henderson Co., and northward.
406. Bidens trichosperma (Michx.) Britt.
Wet prairies, swamps and bottoms, frequent.
407. Bidens trichosperma tenuiloba (Gray) Britt.
Wet prairie, Stark Co., common. (Chase.)
408. Bidens aristosa (Michx.) Britton.
Common in wet soil and in bottoms, very variable.

HELENIUM L.

409. Helenium autumnale L.
Wet prairies and bottoms, common.

DYSODIA CAV.

410. Dysodia papposa (Vent.) A. S. Hitchcock. (D. chrysanthemoides Lag.)
Dry gravely soil, common

ACHILLEA L.

411. Achillea millefolium L.
In various situations, common, possibly not native.

ARTEMISIA L.

412. Artemisia candata Michx.
Dry sandy prairies, not common.

MESADENIA RAF.

413. Mesadenia tuberosa (Nutt.) Britton.
Wet prairies, common.

SENECIO L.

414. Senecio Balsamitae T. & G.) Muhl (S. aureus Balsamitae T. & G.)
Common on dry prairies and upland woods.

CARDUUS L.

415. Carduus Hillii (Canby) Porter. (Cnicus Hillii Canby.)
On dry prairies, Stark to Cook counties, and probably more widely distributed, rare

GEOGRAPHICAL DISTRIBUTION.

Before stating either any theories or any facts in regard to the geographical distribution and apparent origin of the prairie flora, the geographical range of the plants composing the flora should be studied as grouped in families, genera and species. From a study of the statistics, thus obtained, facts may be ascertained and theories deduced.

The first and most generalized grouping is by families. The range of a family naturally covers the most extended ranges of all of its species, and, with few exceptions, is larger than the ranges of any of them. The following tables, therefore can give but general facts in regard to the problem under consideration. The families are grouped under six heads, Cosmopolitan, Tropical and Subtropical, Extra-tropical, Northern Extra-tropical, Western Hemisphere, and North America, following the grouping of MacMillan in the Metaspermae of the Minnesota Valley. Each of these heads shows the distinctive range of the family, and not its actual limits. Also, one family may appear under two heads, if this is necessary to show its distinctive range, as Tropical and Sub-tropical, and Western Hemisphere, when a family is practically confined to tropical America.

COSMOPOLITAN FAMILIES.

Typhaceae.	Alismaceae.
Gramineae.	Cyperaceae.
Juncaceae.	Melanthaceae.
Liliaceae.	Iridaceae.
Orchidaceae.	Salicaceae.
Santalaceae.	Polygonaceae.

Portulacaceae.
Ranunculaceae.
Droseraceae.
Papilionaceae.
Polygalaceae.
Malvaceae.
Violaceae.
Gentianaceae.
Cuiscutaceae.
Labiatae.
Plantaginaceae.
Rubiaceae.
Campanulaceae.
Ambrosiaceae.
Caryophyllaceae.
Cruciferae.
Rosaceae.
Linaceae.
Euphorbiaceae.
Hypericaceae.
Umbelliferae.
Convolvulaceae.
Boraginaceae.
Scrophulariaceae.
Rhamnaceae.
Valerianaceae.
Cichoriaceae.
Compositae.

TROPICAL AND SUB-TROPICAL FAMILIES.

Araceae.
Amaryllidaceae.
Phytollaccaceae.
Crassulaceae.
Caesalpinaceae.
Rhamnaceae.
Lythraceae.
Asclepiadaceae.
Solanaceae.
Commelianceae.
Orchidaceae.
Nyctaginaceae.
Minosaceae.
Oxalidaceae.
Melastomaceae.
Apocynaceae.
Verbenaceae.
Rubiaceae.

EXTRA-TROPICAL FAMILIES.

Crassulaceae.
Saxifragaceae.
Geraniaceae.
Oxalidaceae.
Rhamnaceae.
Onagraceae.

NORTHERN EXTRA-TROPICAL FAMILIES.

Crassulaceae.

Drupaceae.

Cistaceae.

Umbelliferae.

Primulaceae.

WESTERN HEMISPHERE FAMILIES.

Nyctaginaceae.

Loasaceae.

Lythraceae.

Polemoniaceae.

Hydrophyllaceae.

NORTH AMERICAN FAMILY.

Hydrophyllaceae.

For the more convenient examination of the above list, they may be gathered into tables, and their relationship, etc., expressed by numbers.

TABLE I.

STATISTICS OF FAMILIES.

	Monocotyledons.	Choripetalae.	Sympetalae.	Totals.
Total No. of Families	43	131	48	222.
Percent of each	19.4	59	21.6	100.
Number in Prairie Flora	12	32.	21	65.
Percent of each in Prairie Flora	18.5	49.2	32.3	100.
Prairie Flora Percent of each	25.6	22.1	3[illegible].5	26.1.

According to Engler and Prantl's Planzenfamilien, from which the total number of families was taken , the families of the prairie flora are but 58, instead of 65. This accounts for the apparent errors in the last column of figures.

This table shows first, an excess of the Sympetalous families, as seen from the fact that 21.6 percent of the world's families are Sympetalae, while 32.3 percent of the prairie families belong to this division, and that 37.5% of the Sympetalous families are represented in the prairie flora, as compared with 26.1% of the whole number. Secondly, the number of Choripetalous families is below the average, constituting but 49.2 % of the number, whilt 59 % of the whole number of families belong in this group. Also 26.1 % of the whole number of families are represented, but only 22.1 % of the Choripetalae. Thirdly, the number of Monocotyledons is practically normal, constituting 19.4 % and 18.5 % of the whole number of families and of the prairie flora families, respectively, and 25.6 % of them occur in the flora, about the same as the 26.1 % representation of the whole.

In table 2 the distribution of these families is shown. This list needs but little comment. The great extra-tropical tendency of the Choripetalae is well shown, also the scanty representation of them as compared with the number in the whole flora of Illinois.

T A B L E II.

STATISTICS OF FAMILIES, --- NUMERICAL DISTRIBUTION.

	Monocotyledons.	Choripetalae.	Sympetalae.	Totals.
Total number	43	131	48	222
No. in Illinois Approximate	21	81	36	138
Number in Prairie Flora	12	32	21	65
Cosmopolitan	2	17	14	40
Tropical and Sub-tropical	4	9	5	18
Extra-tropical	0	6	0	6
Northern Extra-tropical	0	4	1	5
Western Hemisphere	0	3	2	5
North America	0	0	1	1

TABLE III.

STATISTICS OF FAMILIES, --- PERCENTAGE DISTRIBUTION.

	Monocotyledons.	Choripetalae.	Sympetalae.	Totals.
Per-cent of all Cosmopolitan.	22.5	42.5	35.	100
Percent of all Trop. and Subtropical	22.2	50	27.8	100
Percent of all Extra-tropical.		100		100
Percent of all N. Extra-tropical		80	20	100
Percent of all Western Hemisphere		60	40	100
Percent of all North American			100	100
Cosmopolitan percent of each	75	53.1	66.7	61.5
Trop. and Subtrop. percent of each	33.3	28.1	23.8	27.7
Extra-tropical per-cent of each		18.7		9.2
N. Extratrop. percent of each		12.5	4.8	7.7
W. Hemisphere percent of each		9.4	9.5	7.7
North American percent of each			4.8	1.5

In table 3 the distribution is given by percentage in order to facilitate comparisons. From this the following facts may be observed.

1. The cosmopolitan tendency of the Monocotyledons. 75 % of them being of cosmopolitan nature.

2. The extra-tropical tendencies of the Choripetalae: 31.2 % of them being Extra-tropical, and 90 % of the extra-tropical families being Choripetalae.

3. The only pecularily North American family belongs to the Sympetalae. Otherwise they show a general distribution.

These observations are practically the same as those of McMillan; that the Monocotyledous are general, the Choripetalae distal, and the Sympetalae general and localized in their distribution. MacMillan, including many woodland forms in his tables, calls the Symmpetalae central. This is shown neither in the tables of families herewith presented nor in the tables showing distribution by genera.

There are in the prairie flora 208 genera of plants, which may be grouped into six groups, in the same way as the families. And similarly, the limits of the genus may be much larger than those of the species representing it in the prairies. Still the generalizations are not nearly so broad as in the study of distribution by families.

COSMOPOLITAN GENER.

Typha.	Sagittaria.
Andropogon.	Chrysopogon.
Panicum.	Stipa.
Agrostis.	Spartina.

Eragrostis.
Festuca.
Scirpus.
Juncus.
Gyrostachys.
Polygonum.
Silene.
Ranunculus.
Psoralea.
Lespedeza.
Linum.
Euphorbia.
Lythrum.
Genpiana.
Iponoea.
Cuscuta.
Teucrium.
Scutellaria.
Grationa.
Galium.
Lodelia.
Eupatorium.
Erigeron.
Coreopsis.
Artemisia.
Poa.
Cyperus.
Eleocharis.
Habernaria.
Pogonia.
Phypollacca.
Clematis.
Drosera.
Meibomia.
Oxalis.
Polygala.
Hypericum.
Eryngium.
Asclepias.
Convolvulus.
Menpha.
Brunella.
Solanum.
Plantago.
Valeriana.
Vernonia.
Aster.
Gnaphalium.
Bidens.
Senecio.

TROPICAL AND SUB-TROPICAL GENERA.

Aristida.
Scleria.
Fimbristylis.
Hypoxis.

Talinum.
Cracca.
Rosa.
Méntzelia.
Lippia.
Ilysanthes.
Diodia.
Cassia.
Strophostyles.
Croton.
Oenophera.
Physalis.
Ruellia.

EXTRA TROPICAL GENERA.

Savastana.
Calamagrostis.
Koeleria.
Glyceria.
Hordeum.
Carex.
Anemone.
Sophia.
Arabis.
Geum.
Trifolium.
Viola.
Suim.
Lithospermum.
Muhlenbergia.
Sieglingia.
Melica.
Bromus.
Elymus.
Caltha.
Myosurus.
Cardamine.
Saxifraga.
Lathyrus.
Geranium.
Epilobium.
Polemonium.
Antennaria.

NORTHERN EXTRA-TROPICAL GENERA.

Phalaris.
Acorus.
Lilium.
Cypripedium.
Populus.
Eleocharis.
Allium.
Iris.
Salix.
Comandra.

Delphinuim.
Thalictrum.
Penthorum.
Prunus.
Fragaria.
Spiraea.
Astragalus.
Helianthenum.
Cicuta.
Dodecatheon.
Leptandra.
Pedicularis.
Specularia.
Carduus.
Hieracium.
Pulsapilla.
Erysimum.
Parnassia.
Rosa.
Potentilla.
Ulmaria.
Falcata.
Lechea.
Androsace.
Apocynum.
Linaria.
Campanula.
Leptilon.
Nadalus.
Lactuca.

WESTERN HEMISPHERE GENER.

Muhlenbergia.
Bouteloua.
Nothoscordum.
Allionia.
Mentzelia.
Oenothera.
Lippia.
Gerardia.
Ambrosia.
Helianthus.
Dysodia.
Sporobulus.
Tradescantia.
Sisyrinchium.
Acuan .
Cuphea.
Verbena.
Conobea.
Grindelia.
Heliopsis.
Verdesina.

NORTH AMERICAN GENERA.

Eatonia.	Quamasia.
Melanthium.	Limnodorum.
Heuchera.	Baptisia.
Amortha.	Kuhnistera.
Ceanothus.	Callirrhoë.
Rhexia.	Onagra.
Kneiffia.	Gaura.
Polytaenia.	Eulophus.
Zizia.	Thaspium.
Oxypolis.	Steironema.
Asclepiodora.	Acerates.
Phlox.	Macrocalyx.
Physostegia.	Koellia.
Monarda.	Castilleja.
Synthyris.	Pentstenon.
Chelone.	Houstonia.
Kuhnia.	Lacinaria.
Chrysopsis.	Solidago.
Euthamia.	Boltonia.
Doellingeria.	Ionactis.
Silphium.	Parthenium.
Rudbeckia.	Ratibida.
Brauneria.	Helenium.
Mesadenia.	Adopogon.
Nothocalais.	

Gathering these again into tables we have the following results.

T A B L E IV.

STATISTICS OF GENERA.

	Monocotyledons.	Choripetalae.	Sympetalae.	Totals.
Number of Genera in Prairie Flora	48	75	85	208
Per cent	23.1	36.1	40.8	
Average number of genera per family	4	2.3	4.1	

The preponderance of the Sympetalae shows again the specialized tendencies of the prairie flora, while the percentage of Choripetalae and the low number of genera per family shows that compratively speaking, the Choripetalae form the most insignificant group of the flora. Still there among the Choripetalae numerous genera, which are characteristic plants of the prairies, and some families, such as the Leguminosae are abundantly represented.

T A B L E V.

STATISTICS OF GENERA,--- DISTRIBUTION.

	Monocotyledons.	Choripetalae.	Sympetalae.	Totals.
Total number of Genera	48	75	85	208
Cosmopolitan	18	16	24	58
Tropical and Subtropical	4	8	5	17
Extra-tropical	11	14	3	28
Northern Extra-trop.	7	20	15	42
Western Hemisphere	6	5	10	21
North America	4	15	30	49

T A B L E VI.

STATISTICS OF GENERA, PERCENTAGE.

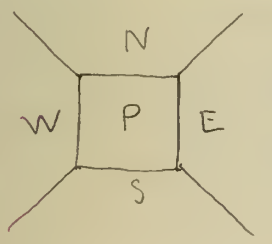
	Monocotyledons.	Choripetalae.	Sympetalae.	Totals.
Total number of % of Genera	23.1	36.1	40.8	100.
% of all Cosmopolitan	31.	26.7	41.4	100.
% of all Tropical and sub-trop.	23.5	47.1	29.4	100.
% of all Extra Trop.	39.3	50	10.7	100.
% of all extra Northern Tropical	16.7	47.6	35.7	100.
% of all Western Hemisphere	28.6	23.8	47.6	100.
% of all North America	8.2	30.6	61.2	100.
Cosmopolitan % of each	37.5	21.3	28.2.	27.9.
Tropical and Sub-tropical % of each	8.3	10.7	5.9	8.2.
Extra tropical % of each	22.9	18.7	3.5	13.5
Northern Extra-tropical % of each	14.6	26.7	17.6	20.2.
Western Hemisphere % of each	12.5	6.7	11.8	10.1.
North American % of each	8.3	20	35.3	23.6.

Table six shows some interesting facts in regard ti distribution. The Monocotyledons have, as is to be expected, the best Cosmopolitan representation. The Choripetalae are in the lead in tropical genera while the Sympetalae are last. Still this does not imply that the Sympetalae are extra-tropical in nautre, but that the

ranges of the Choripetalous genera are greater and naturally more of the tropical genera will extend so far into the temperate regions. This is precisely the arrangement which might be deduced from a consideration of the age of the two groups. The localized tendencies of the Sympetalae are again well shown, 35.3 of them being endemic while 61.2 % of the endemic genera are Sympetalae. To sum up these observations we have the following conclutions: The plants composing the flora of the prairies belong mostly to Cosmopolitan families and to cosmopolitan and endemic genera.

In the study of distribution be species, only their ranges in North America have been considered, as but a small percent extend beyond the continent. The species have then been arranged in four groups, Northern, Eastern, Southern, and Western, accordingly as their range extends north, east, south or west of the prairie province, which is here held to include the territory from Ohio to the Dakotas, Kansas, and Missouri. Any species whose range extends east of Ohio, between Newfoundland and North Carolina is entered as eastern. Ranges south of Kentucky and Arkansas between South Carolina and Texas are southern; ranges west of Kansas between Texas and Assiniboia are western, and ranges between manitoba and Newfoundland north of Minnesota and Michigan are northern.

The intention has been to divide the continent into divisions as shown in the diagram, where P represents the prairie region



and N. E. W. S. the four extra prairie ranges. The limits, as given above, must of necessity be flexible, although it was thought that division along those lines would approach nearest a division of the continent into natural floral provinces. From combinations

of the above four provinces we have groups , as followes: The N, S, E, W, or continental, the N, E, S, the N, W, S, the E, W, S, and the W, N, E, the N, E, E, S, S, W, and W, N, the E, W , and the N, S, or a total of sixteen groups. The plants of the Illinois prairies are grouped in them as followes.

1. The Continental Group.

Including those plants whose ranges extend beyond the prairie province in four directions, but not necessarily truly continental.

Typha latifolia.	Sagittaria latifolia.
Agrostis hyemalis.	Calamagrostis Canadensis.
Eatonia obtusata.	Elymus Canadensis.
Panicularia nervata.	Chrysopogon avenaceus.
Bouteloua curtipendula.	Eatonia Pennsylvanica.
Festuca octoflora.	Panicum capillare.
Scirpus lacuspris.	Eleocharis palustris.
Carex fusca.	C. scoparia.
C. stipata.	Juncus tenuis.
Allium ceruuum.	Hypoxis hirsuta.
Cypripedium parviflorum.	Populus deltoides.
Comandra umbellata.	Polygonum punctatum.
P. hydropiperoides.	P. lapathifolium.
P. emersum.	Silene antirrhina .
Thalictrum purpurascens.	Drosera rotundifolia.
Spiraea salicifolia.	Geranium Carolinianum.
Euphorbia nutans.	Onagra biennis.
Sium cicutaefolium.	Cicuta maculata.
Apocynum cannabinum.	Cuscuta arvensis.

Euthamia graminifolia.	Aster laevis.
Dollingeria umbellata.	Helianthus giganteus.

3. The North-West Group.

Bouteloua oligostachya.	Allionia nyctaginea.
Pulsatilla hirsutissima.	Delphinium Carolinianum.
Erysimum asperum.	Sophia incisa.
Amorpha Fruticosa.	Kuhnistera candida.
Astragalus Carolinianus.	Androsace occidentalis.
Lithospermum angustifolium.	Castilleja sessiliflora.
Ambrosia psilostachya.	Solidago rigida.
Rudbeckia hirta.	Helianthus scaberrimus.

4. East-South-West Group.

Panicum Scribnerianum.	Sieglingia purpurea.
Scirpus lineatus.	Eleocharis Engelmanni.
Juncus Torreyi.	Salix nigra.
Fragaria Virginiana.	Oxalis violacea.
Oxalis stricta.	Steironema lanceolatum.
Lithospermum Gmelini .	Galium tinctorium.
Helenium autumnale.	Senecio Balsamitae.

5. The West-North-East Group.

Koeleria cristata.	Phalaris arundinacea.
Poa flava.	Savastana odorata.
Carex Monile.	Carex aristata.
Carex lanuginosa.	Carex teretiuscula.
Carex Sartwellii.	Sisyrinchium angustifolium.
Salix fluviatil is.	Anemone Canadensis.
Caltha palustris.	Heuchera Hispida.
Potentilla Monspelensis.	Potentilla arguta.

Lathyrus palustris.
Polygala Senega.
Mentha Canadensis.
Nabalus racemosus.
Aster Novae-angliae.
Aster ptarmicoides.

6. The North-East Group.

Bromus Kalmii .
Scirpus fluviatilis.
Carex Haydeni.
Carex conoidea.
Carex cristatella.
Carex straminea.
Carex straminea.mirabilis.
Salix discolor.
Ranunculus ovalis.
Anemone cylindrica.
Saxifraga pennsylvanica.
Parnassia Caroliniana.
Spiraea tomentosa.
Meibomia Canadensis.
Steironema quadriflorum.
Macrocalyx nyctelea.
Gerardia paupercula.
Pedicularis lanceolata.
Solidago juncea.

7. The East-South Group.

Aristida oligantha.
Aristida tuberculosa.
Eragrostis pectilacea.
Melica mutica.
Muhlenbergia diffusa.
Panicum dichotomum.
Panicum virgatum.
Sieglingia seslerioides.
Sporobolis longifolius..
Sporobolus vaginaeflonus.
Cyperus filiculmis.
Scleria triglomerata.
Fimbristylis castanea.
Carex lurida.
Carex festucacea.
Acorus Calamus.
Tradescantia Virginiana.
Juncus scirpoides.
Juncus brachycarpus .
Nothoscordum bivalve.
Allium Canadense.
Melanthium virginicum.
Sisyrinchuim graminoides.
Limnodorum.tuberosum.
Gyrostachys gracilis.
Gyrostachys cernua.

Pogonia ophioglossoides.
Salix humilis.
Polygonum Pennsylvanicum.
Phytollacca decandra.
Delphinium tricorne.
Cardamine bulbosa.
Rosa humilis.
Potentilla canadensis.
Cassia Chamaechrista.
Trifolium reflexum.
Cracca Virginiana.
Lespedeza capitata.
Strophostyles.helvola.
Polygala viridescens .
Polygala polygama.
Euphorbia corollata.
Hypericum maculatum.
Lechea villosa.
Viola sagittata.
Lythrum alatum.
Kneiffia fruticosa.
Gaura biennis.
Thaspium barbinode.
Zizia aurea.
Asclepias.tuberosa.
Asclepias exaltata.
Phlox maculata .
Phlox divaricata.

Habenaria leucophae.
Polygonum tenue.
Polygonum incarnatum.
Myosurus minimus.
Arabis laevigata.
Penthorum sedoides.
Rosa setigera.
Prunus serotina.
Baptisia tinctoria.
Psoralea Onobrychis.
Lespedeza violacea.
Falcata Pitcheri.
Polygala verticillata.
Polygala incarnata.
Croton capitatus.
Cennothus Americanus.
Helianthemum majus.
Lechea tenuifolia.
Viola pedata.
Parsonsia petiolata.
Rhexia Virginica.
Oxypolis rigidus.
Eryngium aquaticum.
Gentiana quinquefolia.
Asclepias obtusifolia.
Ipomoea pandurata.
Phlox glaberrima.
Polemonium reptans.

Verbena angustifolia.	Lippia lanceolata.
Teucrium Canadense.	Scutellaria parvula.
Monarda fistulosa.	Koellia flexuosa ,.
Koellia Virginiana.	Solanum Carolinense.
Chelone glabra.	Pentstemon hirsutus.
Gratiola sphaerocarpa.	Ilysanthes gratioloides.
Gerardia tenuifolia.	Ruellia ciliosa.
Plantago Rugelii.	Diodia teres.
Lobelia syphilitica.	Lobelia leptostachys.
Adopogon caroliniamum.	Eupatorium altissimum.
Kuhnia eupatorioides.	Lacinaria squarrosa.
Lacinaria scariosa.	Lacinaria spicata.
Solidago speciosa.	Euthamia Caroliniana.
Boltonia asteroides.	Aster azureus.
Aster dumosus.	Aster ericoides.
Aster vimineus.	Ionactis linariifolius.
Gnaphalium obtusifolium.	Silphium perfoliatum.
Parthenium integrifolium.	Ratibida pirrata.
Helianthus jirsutus.	Helianthus grosse-serratus.
Coreopsis lanceolata.	Coreopsis tripteris.
Bidens trichosperma.	Artemisia caudata.

8. South-West Group.

Bouteloua hirsuta.	Hordeum nodosum.
Panicum autumnale.	Psoralea floribunda.
Psoralea tenuiflora.	Mentzelia oligosperma.
Verbena stricta.	Verbena bracteosa.
Physalis lanceolata.	Plantago aristata.
Grindelia squarrosa.	Chrysopsis villosa.

Solidago Missouriensis.

9. The West-North Group.

Hordeum jubatum.
Lilium umbellatum.
Polygonum Hartwrightii.
Apocynum hypericifolium.
Stipa spartea.
Polygonum ramosissium.
Viola pedatifida.
Valeriana edulis.

10. The South-North Group.

Amorpha canescens.
Hieracium longipilum.
Coreopsis palmata.
Gentiana puberula.
Brauner pallida.

11. The West-East Group.

Ceanothus ovatus.
Teucrium occidentale.
Heliopsis scabra.
Convolvulus sepium.
Eupatorium maculatum.

12. The North Group.

Sporobolus heterolepis.
Nothocalais cuspidata.
Asclepias ovaliifolia.

13. The East Group.

Sporobolus neglectus.
Habenaria psycodes.
Rosa blanda.
Helianthemum Canadense.
Onagra cruciata.
Gentiana flavida.
Lacinaria cylindracea.
Aster puniceus.
Bidens comosa.
Carex xanthocarpa.
Cypripedium candidum.
Geum Virginianum.
Lechea Leggettii.
Epilodium coloratum.
Galium concinnum.
Solidago Ohioensis.
Antennaria neglecta.
Carduus Nillii.

14. The South Group.

Carex Crus-corvi.
Clematis Simisii.
Quamasia hyacinthina.
Anemone Caroliniana.

Ulmaria rubra.
Acuan Illinoensis.
Baptisia leucantha.
Baptisia bracteata.
Psoralea pedunculata.
Astragalus Plattensis.
Astragalus Mexicanus.
Astragalus distortus.
Euphorbia dentata.
Callirhoë triangulata.
Hypericum sphaerocarpum.
Polytaenia Nuttallii.
Eulophus Americanus.
Asclepiodora viridis.
Acerates Floridana.
Cuscuta indecora.
Cuscuta paradoxa.
Phlox bifida.
Koellia pilosa.
Conobea multifida.
Gerardia aspera.
Gerardia auriculata.
Houstonia purpurea calycosa.
Nabalus asper.
Ambrosia bidentata.
Vernonia fasciculata.
Vernonia Drummondii.
Kuhnia glutinosa.
Lacinaria pycnostachya.
Ssolidago.rigidiuscula.
Sollidago Radula.
Boltonia diffusa.
Aster sericeus.
Aster turbinellus.
Leptilon divaricatum.
Sllphium integrifolium.
Silphium laciniatum.
Silphium terebinthinaceum.
Silphium terebinthinaceum pinnatifidum.
Rudbeckia subtomentosa.
Brauneria purpurea.
Helianthus occidentalis.
Helianthus mollis.
Verbesina helianthoides.
Bidens aristosa.
Dysodia papposa.
Mesadenia tuberosa.

15. The west group.

Acerates lanuginosa.

16. The prairie Group.

Aristida ramosissima.	Eleocharis Wolfi.
Tradescantia brevicaulis.	Meibomia Illinoensis.
Lespedeza leptostachys.	Euphorbia Geyeri .
Lechea stricta.	Oenothera rhombipetala.
Asclepias Sullivantii.	Asclepias Meadii.
Wulfenia Houghtoniana.	Chrysopsis camporum.
Solidago Riddellii.	Boltonia decurrens.
Aster ericoides parviceps.	Helianthus laetiflorus.
Bidens trichosperna tenuiloba.	

Unclasified.

Talinum rugospermum.

This method of grouping, however, is entirely artificial; it shows nothing the various floras which are so well marked and so well known in this territory. The prairie flora of Illinois is made up of several distinct groups; of which in several groups, every species has approximately the same distribution. These may be studied in more detail.

First, both in size and importance, is the Eastern woodland group, compromising about half of the species. The members of this group extend, generally speaking from Nova Scotia and Quebec to Manitoba or Minnesota, and southto Florida and Texas. Practically all the species of the prairie flora which grow also in woods, are found in this group, together with many others which are almost exclusively plants of the prairie. Such plants must necesssarily have a

different habit in Eastern states which are without prairie. The group may again be divided into sub-groups presenting more limited ranges. The Northern sub-group extends south generally to New Jersey, Illinois, and Missouri. Here belong such plants as Scirpus fluviatilis, Salix discolor, Anemone cylindrica, Meibomia Canadensis, Gerardia paupercula. The Southern sub-group, extends from Connecticut, New York or New Jersey to Illinois or Minnesota, and south to the Gulf. It may well be regarded as a transition between the Northern sub-group, and the Southern group. Parsonsia petiolata, Phlox glaberrima, and Gratiola sphaerocarpa are examples of this group. Secondly the Southern group is distributed over all the Southern states, and extending northward in the east, to North Carolina, Virginia or New Jersey, and in the west into southern Illinois and in smaller numbers into Minnesota and as far as the Northwest Territory. Here belong Panicum autumnale, Carex Crus corvi, Clematis Simsii, Psoralea pedunculata, Acerates Floridana, Boltonia diffusa and many others. A portion of this group may be considered seperately as the Sub-endemic, as will noted later. Thirdly there a number of western plants mostly of wide or general distribution over the western states extending eastward into Illinois, some even farther than New York and Ontario. Such plants are Juncus Torreyi, Lilium umbellatum, Pulsatilla hirsutissima, Psoralea tenuiflora and floribunda, and Viola pedatifida. These species, growing as they do on the Western plains and prairies are in Illinois, almost entirely prairie plants, and the group includes some of the most common and conspicuous members of the flora.

Fourthly, a group of plants almost all Monocotyledons and Choripetalae are well distributed over British America especially

the eastern part, and extend in their southern range as far as Illinois and Kansas, or in general terms, as far as the limits of the Southern group. There are twenty eight such plants, of which thirteen are Monocotyledons and ten Choripetalae. Here belong Caltha palustris, Anemone Canadensis, Potentilla arguta, Asclepias ovaliifolia.

The Continental group, including those which extend over the whole continent or the whole of the United States needs no remark.

Lastly we have the group of plants which are practically confined to the prairies of the central states. In addition to those previously listed, there a few who limits extends so slightly over the bounds of the prairie region that they have been for convenience placed in this group. These are Habenaria leucophaea, Delphinium tricorne, Ulmaria rubra, Psoralea Onobrychis, Steironema quadriflorum, Phlox bifida, Gerardia asper, Nothocalais cuspidata, Lacinaria cylindracea, Solidago Ohioensis, and Carduus Hillii. There is also a number of plants, mostly characteristic of the prairie, but showing a southern range, which should possibly be included here. These may becalled the sub-endemic group. Their range extends over the prairie states Illinois, Iowa, Kansas, and south into Texas. These plants are Baptisia bracteata, Amorpha canescens, Astragalus Mexicanus, and distortus, Euphorbia dentata, Callirrhoë triangulata, Polytaenia Nuttallii, Eulophus Americanus, Cuscuta paradoxa, Hieracium longipilum, Nabalus asper, Ambrosia bidentata, Vernonia fasciculata, and drummondii, Lacinaria pycnostachya, Solidago radula, Aster sericeus and turbinellus, Leptilon divaricatum, Silphium integrifolium,

laciniatum, and terebinthinaceum, Rudbeckia subtomentosa, Brauneria pallida, Helianthus mollis, Coreopsis palmata, Bidens aristosa,. The great proportion of Compositae in this list is especially striking. This peculiar distribution is to be accounted for, not by the soil, for the southern soils are not glacier-formed prairies, but by the similar climate, the increased altitude offsetting the southern location, and the treelessness of the prairies of Texas and Oklahoma. Summing up the facts already observed it is seen that the prairie flora of Illinois belongs to no one group in particular, but is a complex derived from a number of groups. Chief of these is the great Eastern woodland group, from which about half of the species have been derived. This applies however only to the eastern prairie states: Illinois, Iowa, Indiana, and part of Kansas and Nebraska. West of this the Eastren flora is not represented, and the prairie species belong mainly to western and southern groups. Next in importance the Southern Flora contains numbers of characteristic species as does also the Western Group, while the Northern group is of relatively little importance.

The general idea of the prairie flora seems to be that it contains large numbers of species peculiar to it. This however is erroneous as there are only 55 species that can be regarded as peculiar to the prairie.

The distribution of the species in Illinois is very simple. The state is not large enough to allow for many peculiarities. As a rule, all species extend accros the state from east to west, but many of them show a limited meridian distribution. The latter is true particularly of southern plants. There four zones of these in the state. The first extends throughout the state and north into

Minnesota. The second extends as far north as Kankakee , LaSalle and Peoria counties, and includes such plants as Clematis Simsii, Acuan Illinoensis, Parsonsia petiolata and Aster turbinellus. The third zone extends north as far as a diagonal line corresponding with the limit of the glacier, or to Shelby, Menard and Fulton counties. It is characterized by Diodia teres, Ambrosia bidentata, and Croton capitatus. The fourth zone is practically confined to the extreme southern portion and consists almost entirely of woodland plants. Such are Asclepias perennis, Fagus Americana, Bumelia lanuginosa, Solidago Drummondii, Liquidambar Styraciflua and numeruos others. A few plants such as Castilleja sessiliflora, Asclepias ovaliifolia and Acerates lanuginosa, northern or western in their range, are confined to the northern part of the state, and similarly a few are limited to the western portion, as Mentzelia oligosperma, and Solidago Radula.

In conclusion, a few general notes on some of the more important prairie plants might be of interest. First indistribution, notoriety and importance is the "blue-joint" grass, Andropogon furcatus. This species formed the bulk of the grass covering of the drier upland prairies, and was of considerable value for pasturage and hay. Until the flowering season, August to September, it was about eighteen inches high. Then the wiry flowering culm, topped by three to five digitate, radiating spikes, shot up to the height of four or five feet.

In the wet or marshy prairies, the blue-joint was replaced by Spartina cynosuroides, variously called reed-grass, marsh-grass, or more commonly, slough-grass. This grass formed a dense sod offering much resistance to the settler's plow, and the

flowering stems were of great height, often higher than the head of a man on horseback.

These two grasses, with the addition in smaller quantities of Panicum virgatum, and Chrysopogon avenaceus, formed the basis of the whole flora. Scattered throughout the prairie, varying with the climate and the environment were more than four hundred other species. These occured, as has been previously noted, not in scattered individuals but in patches. Traces of this habit may be seen yet along the railways. Of these a number have been segregated as being of more importance than others.

Echinacea angustifolia, the hedgehog cone-flower, comes from a deep fleshy root extending far below the reach of fires. Its rough, rigid stems are two or three feet high. The heads, three inches across with pink-purple rays, make this plant one of the most conspicuous and characteristic members of the prairie flora at its blooming period from June 15 to July 1.

Two sunflowers, Helianthus grosse-serratus, and Helianthus rigidus were characteristic. Both bloom in August and September. The stems are often six feet high, or even more, with yellow heads about two inches in diameter.

The prairie-dock, Silphium terebinthinaceum was, and still is, a common and widely distributed plant. Its immense ovate leaves are twelve to eighteen inches long, and the slender flowering stem reach a height of ten feet.

A related species with larger flowers and laciniate leaves, the Rosin-weed or Compass-plant, Silphium laciniatum, was equally common, and of immense size. The first name comes from the aromatic gum which exudes from the broken stem. The latter name is due to the vertical root-leaves which tend to place their edges north and

south. Many erroneons statements have been published on this peculiarity, exaggerating the accuracy of direction which the leaves take. Generally speaking, they point north and south, with a variation of perhaps fortyfive degrees on either side, but they may stand east and west. This is due, not as has been stated, to any influence of the magnetic pole, but to the presence of an equal number of stomata on each surface of the leaf.

A sixth Composite, Bidens aristosa, in Central Illinois usually called Spanish needle, formed dense and immense patches in the wetter soil. Its large yellow-rayed heads are produced in great abundance, making the plant most conspicuous in August and September, when yellow lines of it may be seen bordering the ponds and marking the course of the prairie creeks.

Phlox glaberrima was often common in wet places, blooming in June. Its stems, three feet high, with large compact panicles of red-purple flowers make it the equal of the garden Phlox.

Tick-trefoil, Desmodium Illinoense, was common on dry prairies, growing three to five feet high. It bloomed in June, and the jointed adhesive fruit was ripe in July.

Butterfly-weed, Asclepias tuberosa, is yet very common. The flowers are orange-red in color, and being placed close together in umbels, makes a very conspicuous show for the middle of July. Mr. V. H. Chase states that at Wady Petra in Stark County, it is in danger of becomming extinct, because it never produces seed.

The Red-root, Ceanothus Americanus, was one of the few shrubs that could withstand the prairie fires. It has a thick red root which gives it its name. In the summer a stem would grow up two or three feet high, and the root would increase in size. Every

fall the fires would destroy the stem but spare the root which, increasing thus in size every year, attained a diameter of six or eight inches and a correspondingly great depth, while the stem was still short and thin.